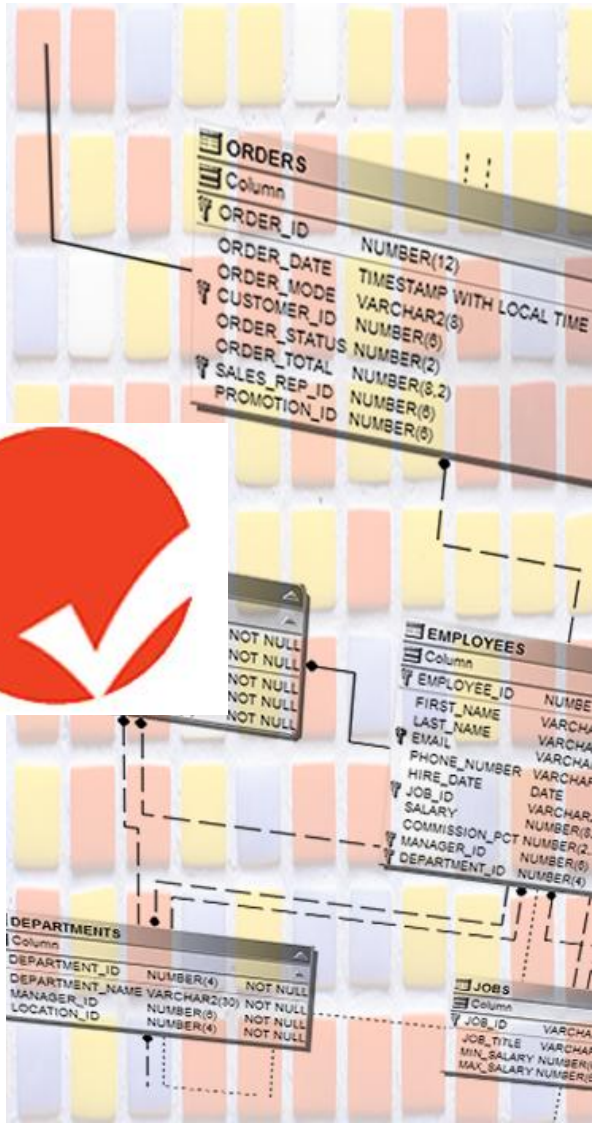

ModelRight 4.0 Help

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ModelRight 4.0

Data Modeling Done Right

Whether you are a beginner or an expert data modeler, ModelRight is the database design tool of choice.

It is the answer when you need a database modeling tool that surpasses the "least common denominator" approach taken by others.

ModelRight 4.0 Help

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Foreword

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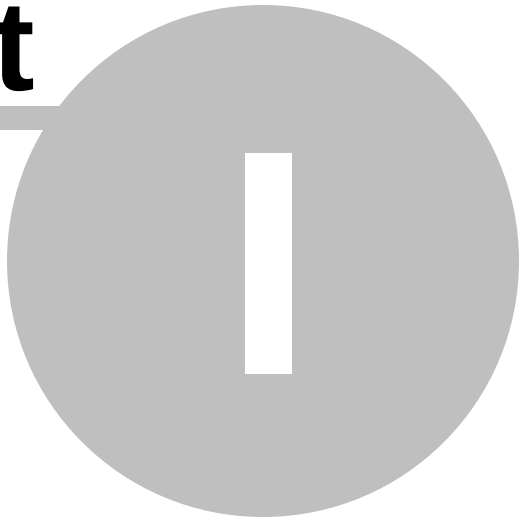
Part



1 Welcome to ModelRight 4.0

Welcome to the Next Generation in Database Design

ModelRight radically simplifies the development of your database design. It will help you to visualize and manage the complexity of your database and create a solid database design. ModelRight can also help you enforce complex constraints, manage database views, validate design decisions, and create complete CREATE and ALTER scripts. It has been developed from the start to support many of your database's most advanced features, without sacrificing intuitive ease of use.

It combines all the standard features like drag/drop, undo/redo, reporting, printing, on-diagram editing, etc... with powerful and advanced design features like Templates, in-depth database-specific support, scripting, and comparisons with your database or another Model. We are convinced that it is the best database modeling product available today at any price. It is the answer when you need a database modeling tool that surpasses the “least common denominator” approach taken by others.

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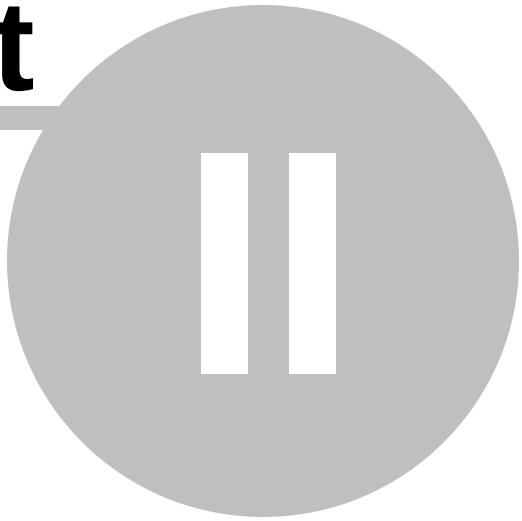
Part



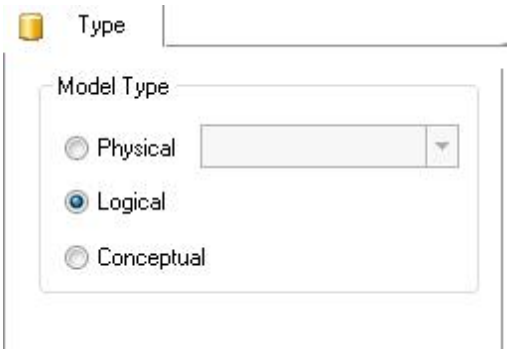
2 Whats New

Whats New

LOGICAL AND CONCEPTUAL MODELING
MODEL SOURCES
DERIVE AND COMPARE MODELS
AUTO SAVE/RESTORE
SAVE MODEL CHANGE HISTORY
DEFAULT OBJECT GRAPHICS
USER_DEFINED ICONS
MODEL TEMPLATE

Logical and Conceptual Modeling

ModelRight 4.0 introduces Logical and Conceptual Model types:



The Model/Type property page

When Logical or Conceptual is selected, your Model is then defined in terms of Entities, Attributes, Relations, Key Constraints, Check Constraints and Logical Datatypes.

ModelRight also allows you to create supertype/subtype and many-to-many relations in a Logical Model.

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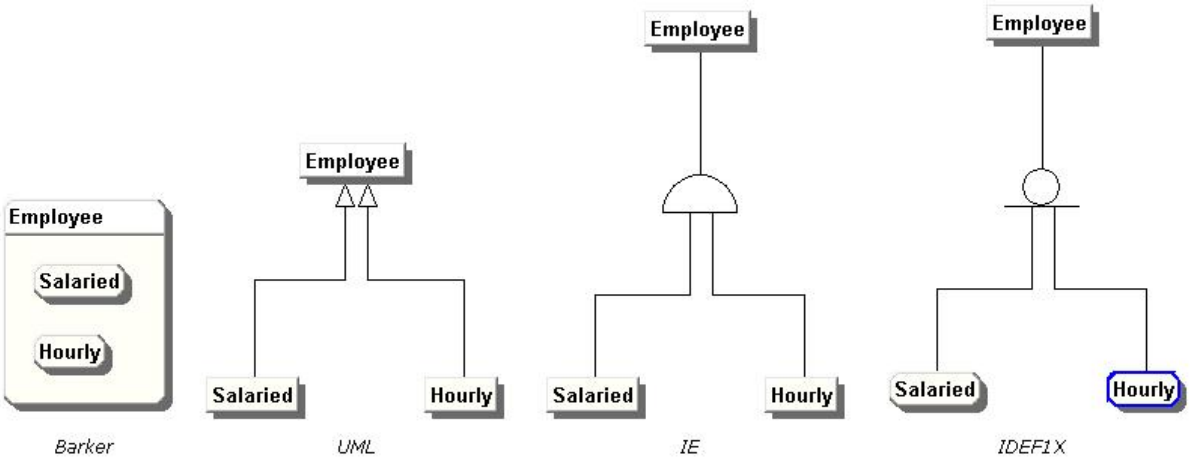
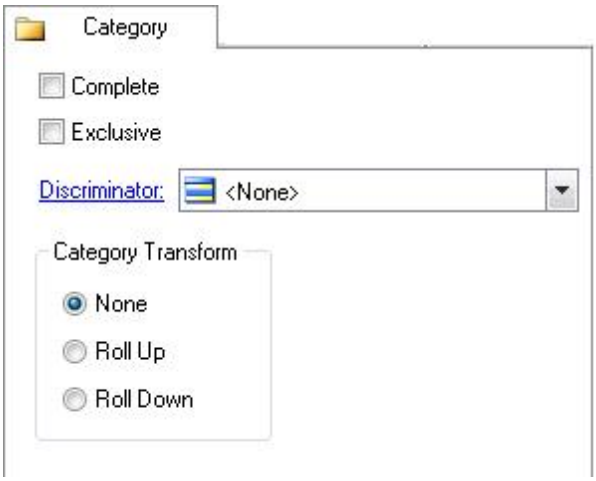


Supertype/subtype symbols in the various notations that ModelRight supports.

When a supertype/subtype symbol is selected, the property page of the Property Browser contains the following controls:



Category Transform - specify how to convert the supertype/subtype structure when converting to a physical model:

Model Sources

ModelRight 4.0 introduces the concept of a Model Source. A Model Source stores information about Model to Model compares so that previously matched objects are matched even if their name changes. A Model Source also allows you to see what has changed in either of the compared Models since the last time they were compared. It also allows you to update your Model automatically with any changes made in the Model Source since the last Sync/Refresh (see Refresh).

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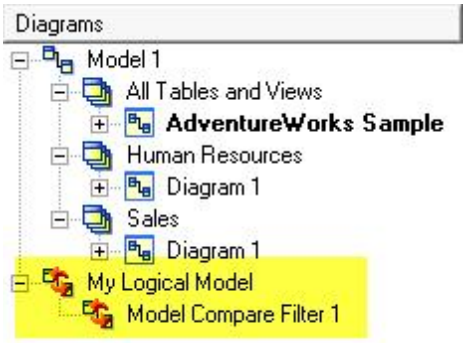
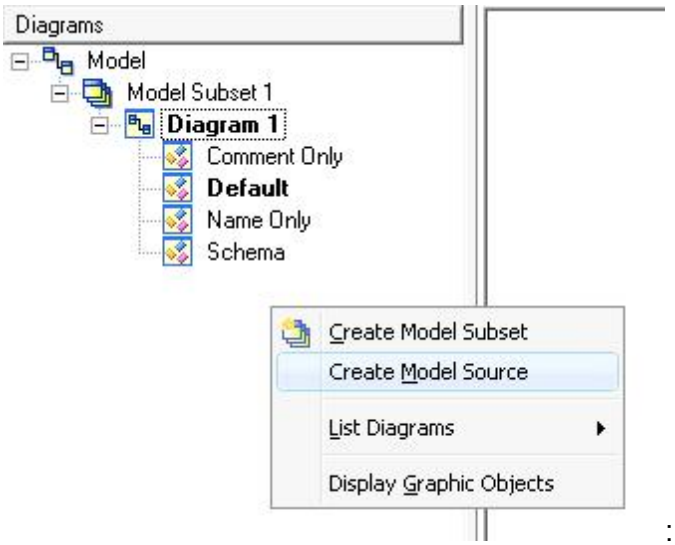
Model Sources are listed in the Diagrams section of the Model Explorer under the Model Subset and Diagram objects.



Model Source objects in the Model Explorer

You can create a new Model Source by right clicking on the background of the Model Explorer's Diagrams section and selecting "Create Model Source"



:

or simply by doing a Model to Model compare (i.e.selecting Compare with Model under the Model menu) and selecting "Save as Model Source".

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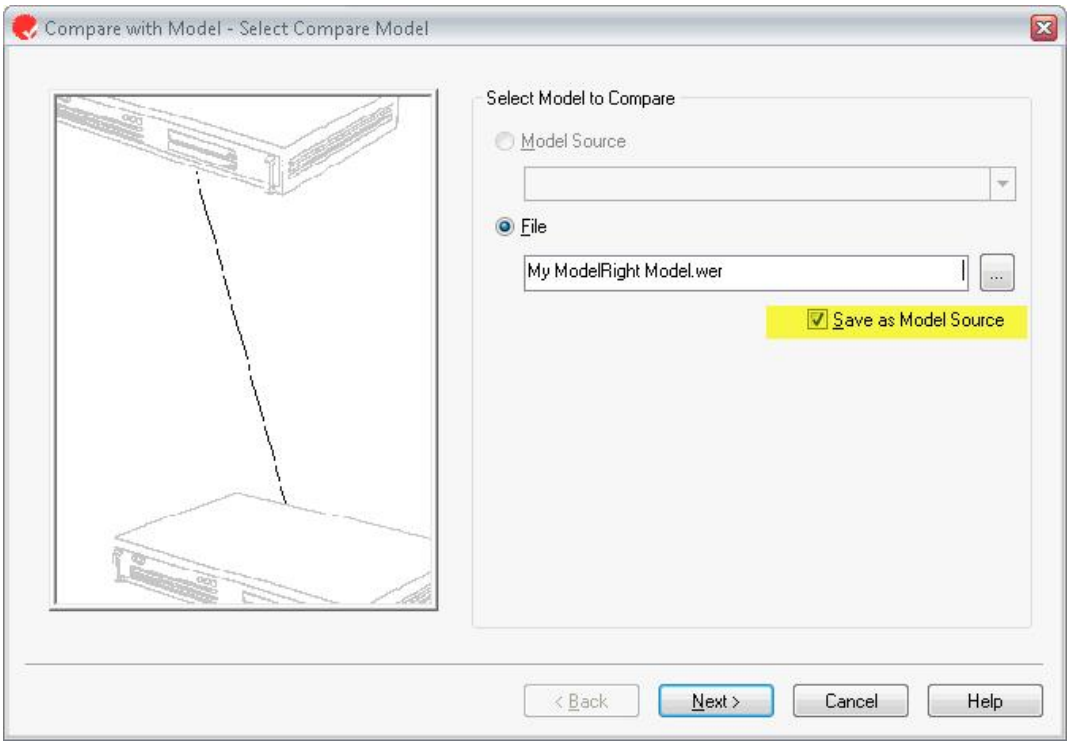
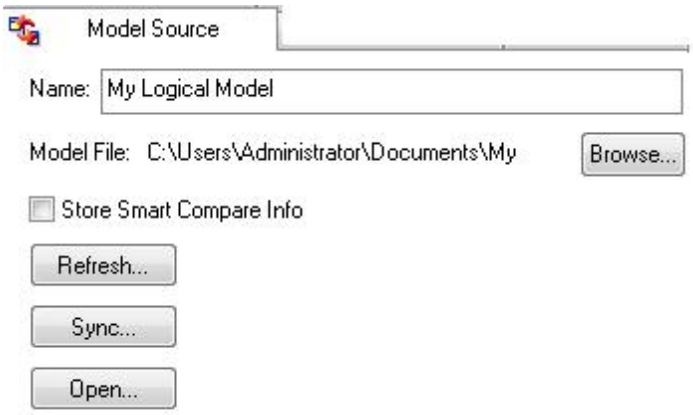


The following page is displayed in the Property Browser when a Model Source object is selected:



Model Source property page

Model File - the last known location of the Model Source file. Browse to select a new location.

Store Smart Compare Info - controls whether or not information about which Model changed objects and properties is maintained.

Refresh - if the Model Source Model saves its Change History (see Save Model Change History), then this button will be enabled and allow you to update your Model with any changes that have been made to the Model Source Model since the last Sync or Refresh.

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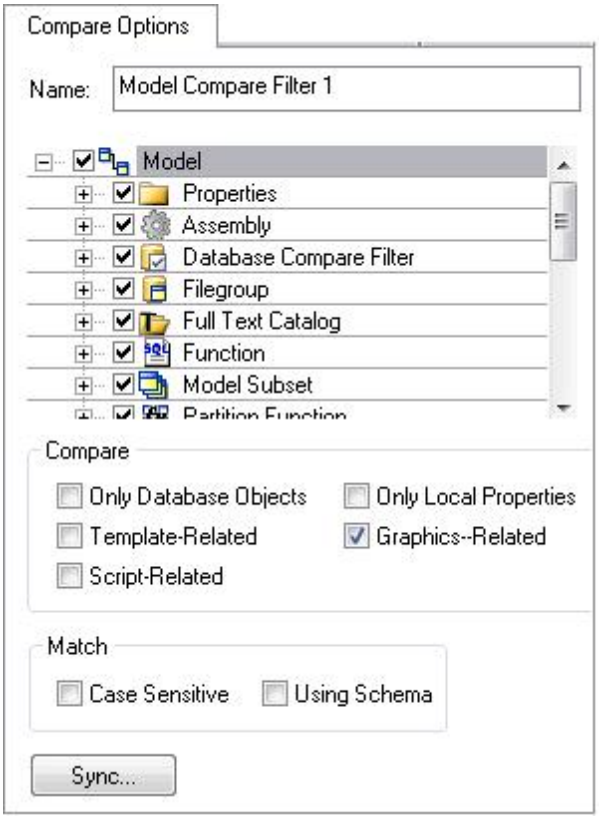
Sync - shortcut button to start a Model to Model Compare using the selected Model Source

Open - shortcut button to open the Model Source's linked Model.

Model Compare Filter

A Model Source can have any number of Model Compare Filters. A Model Compare Filter controls what objects from the other Model are included in the compare. Having multiple Model Compare Filters allows one to quickly and easily compare different parts of the other Model. When a Model Compare Filter is selected, the following property pages are displayed in the Property Browser:



Select the types of objects and properties that you would like to compare.

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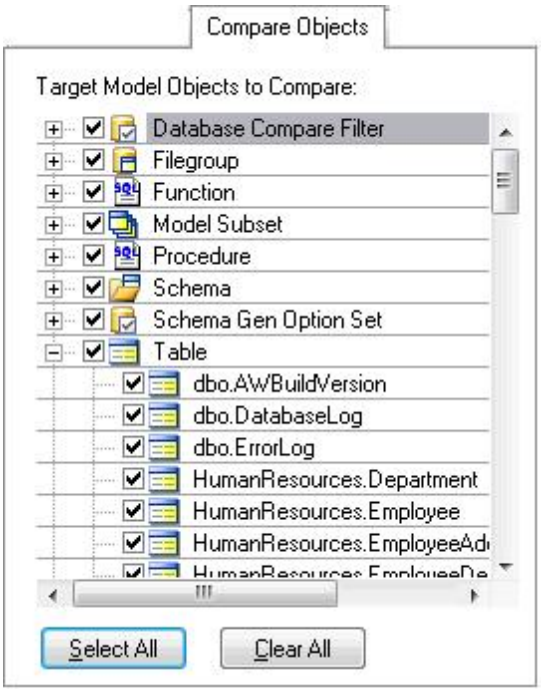
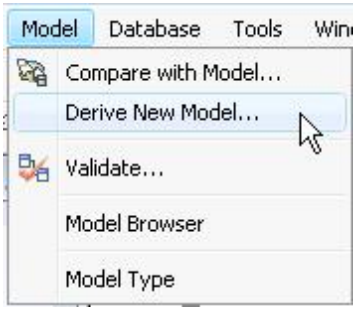


Select specific instances of objects in the other Model to compare.

Derive and Compare Models

To quickly create a new Model from an existing Model, ModelRight 4.0 provides a Derive Model feature:



Derive Model creates a new Model based on the existing Model. The new/derived Model can be a different type of Model (i.e. Logical vs Physical) or a different Physical database type (i.e. Oracle vs SQL Server). The derived Model will contain a Model Source that links the objects in the derived Model back to the objects in the original Model.

Selecting the menu item Model/Derive Model Wizard will bring up a wizard with the following pages:

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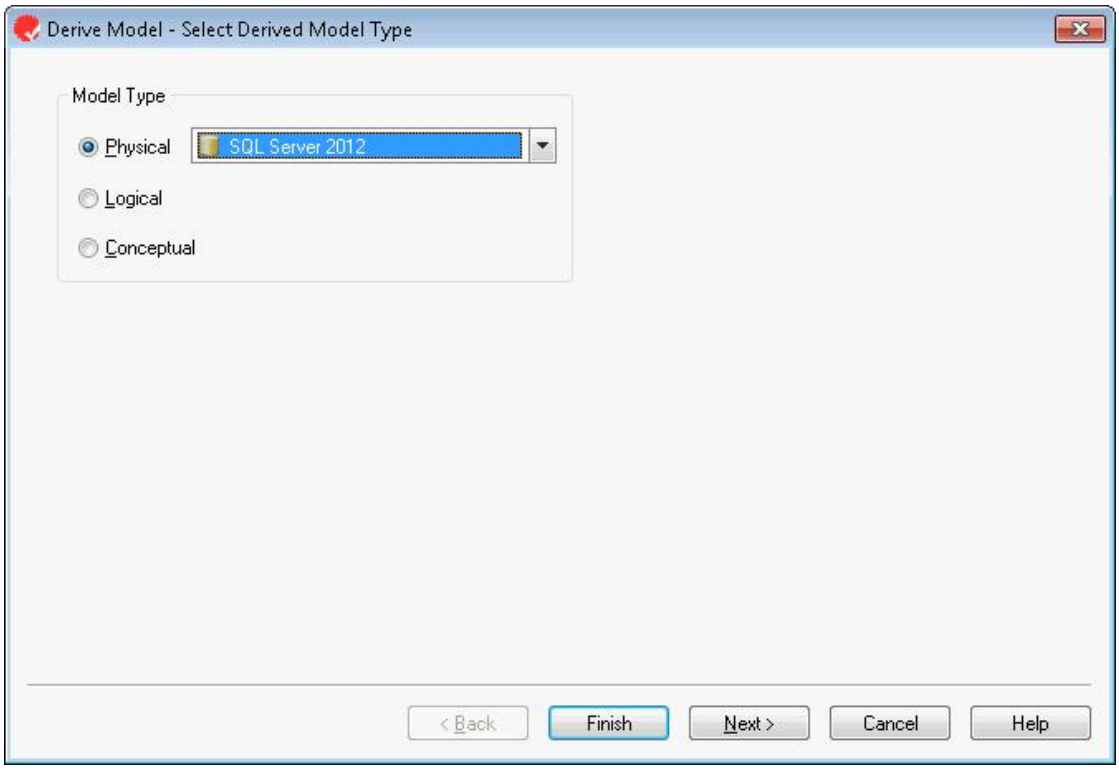
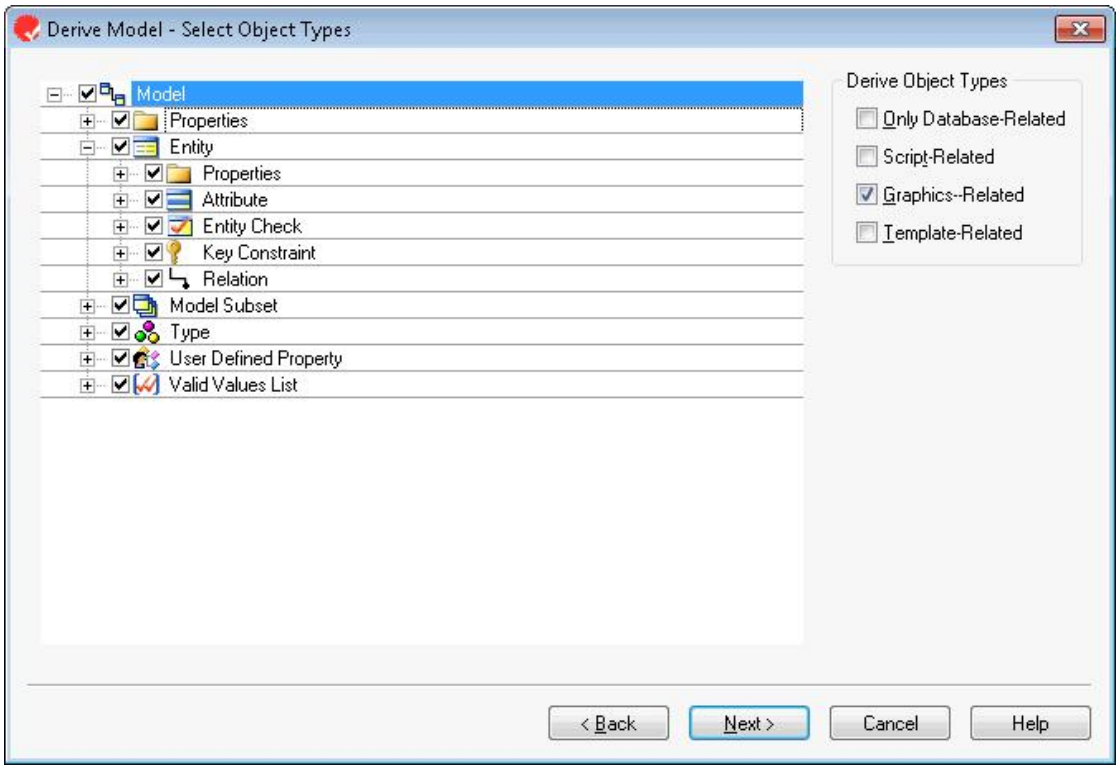


Select the type of Model that you would like to create from the existing Model.



Select the type of objects that you would like to include in the derived model.

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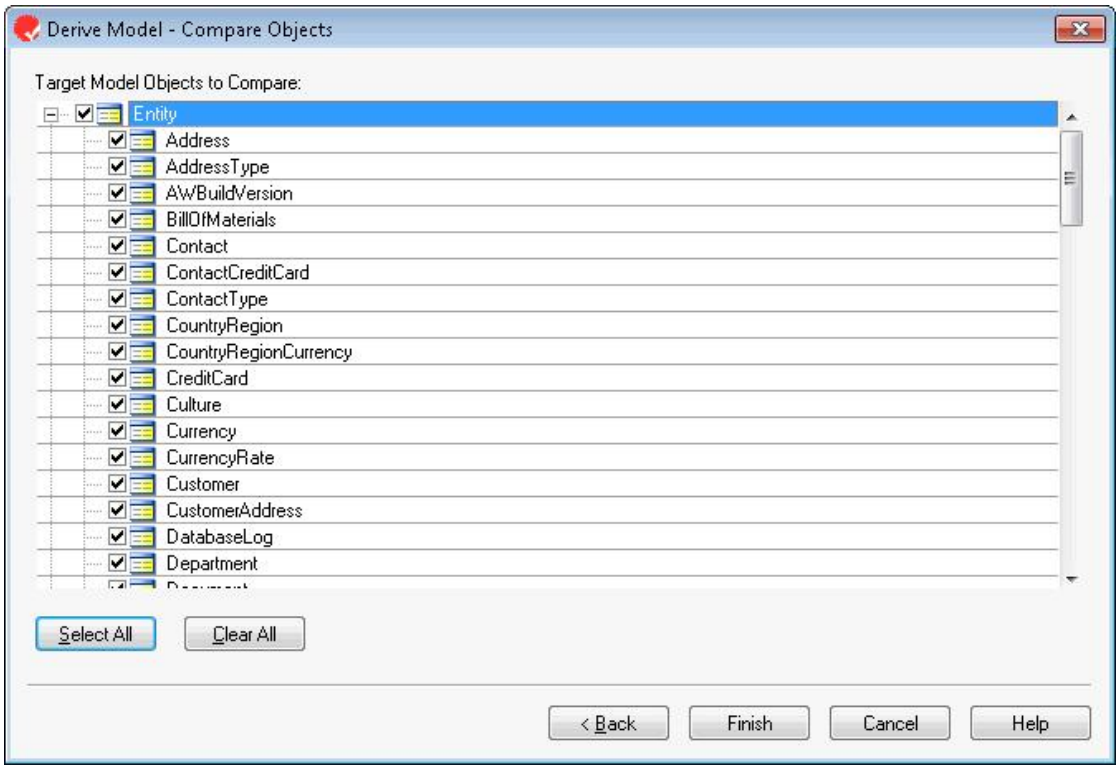
Derive Object Types - select the type of objects to display for selection. This also effects the objects that will be included in the derived Model.



Select specific instances of objects to include or exclude in the derived Model.

When doing a Model Compare, the Select Object Types and Objects wizard pages are also displayed to let you narrow down your compare. With Model Compare the following page is also displayed to show and resolve the differences between the Models being compared:

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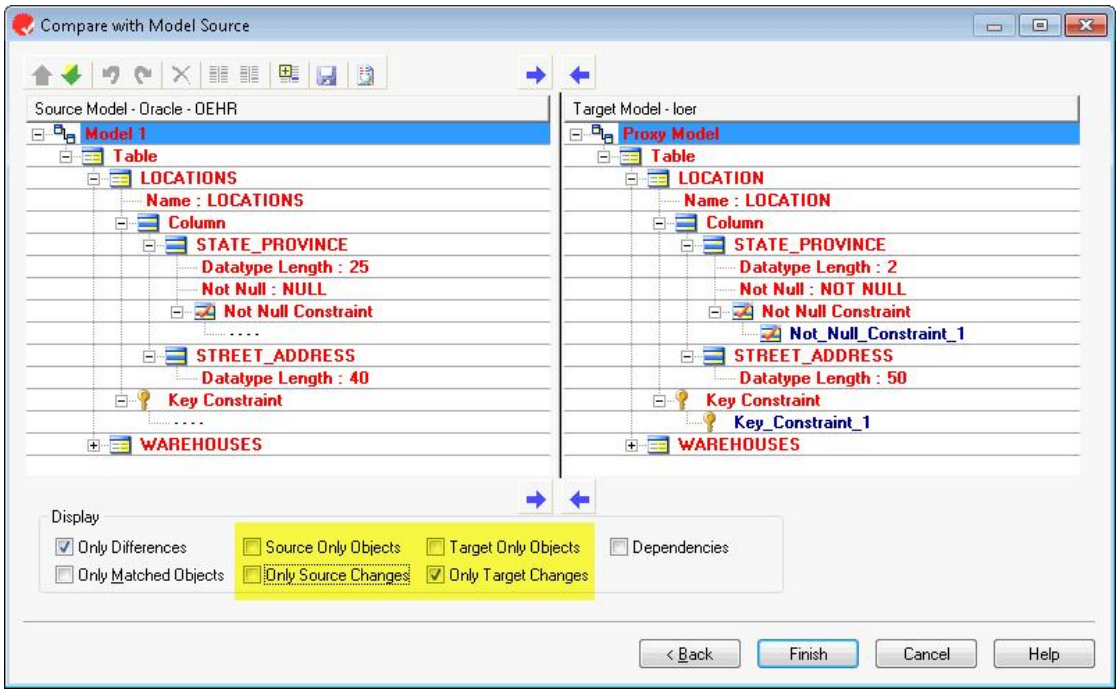

Model Compare dialog

ModelRight 4.0 introduces the following controls:

Source Only Objects - only display objects that have no matching target object

Target Only Objects - only display objects that have no matching target object

Only Source Changes - only display objects and properties that have changed in the source Model since the last compare

Only Target Changes - only display objects and properties that have changed in the other Model since the last compare

Auto Save/Restore

ModelRight 4.0 now includes support for Auto/Save restore. The Tools/Options/Workspace editor contains the following controls related to this option:

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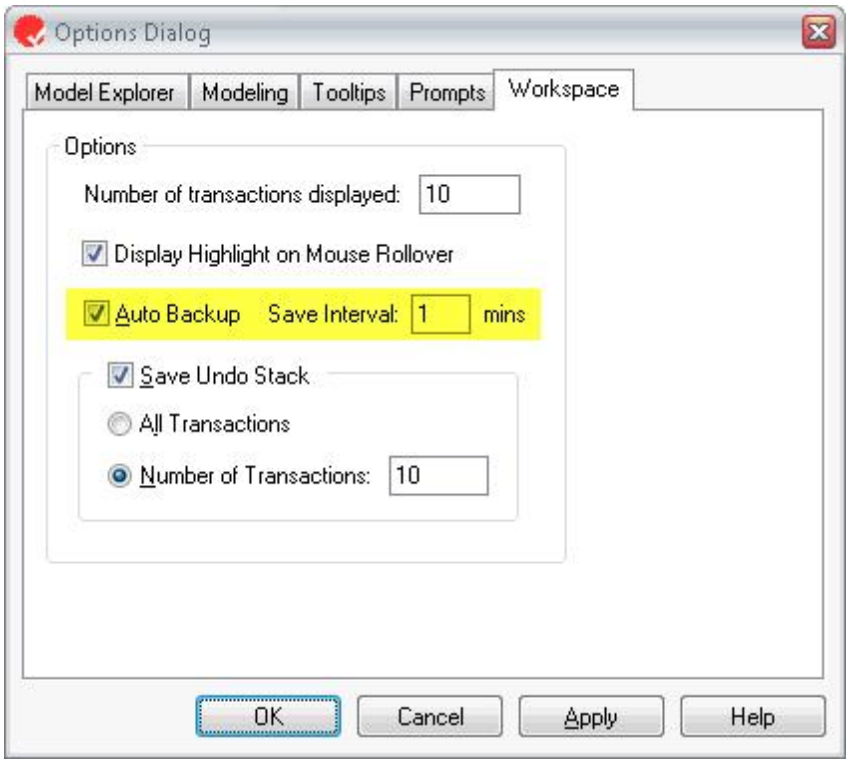

Save Model Change History

ModelRight 4.0 now has the ability to save and restore Undo transactions when you save and close your model. The Tools/Options/Workspace editor contains the following controls related to this option:

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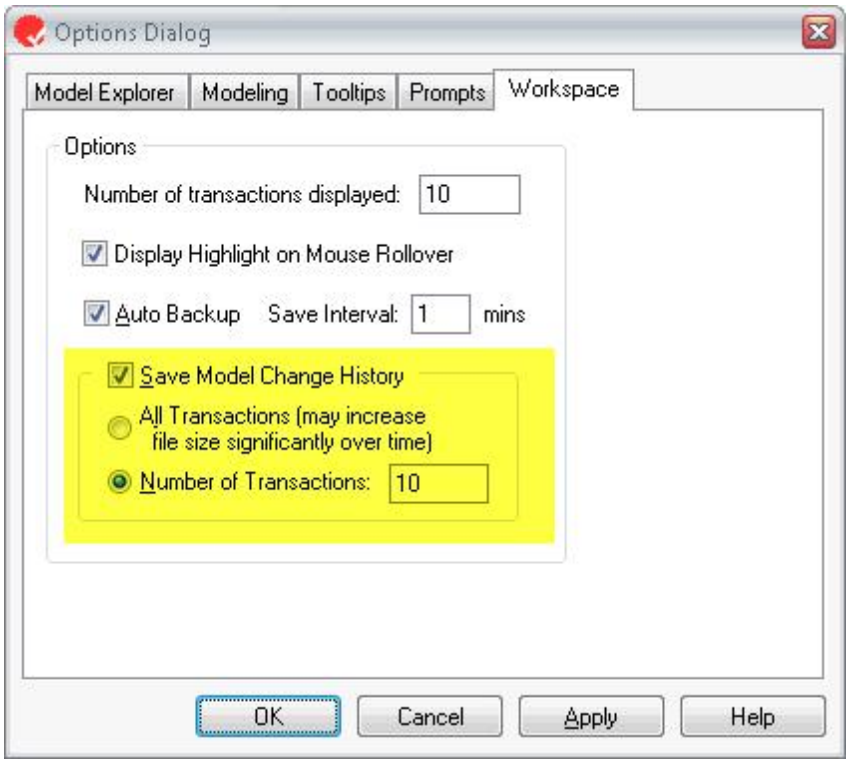
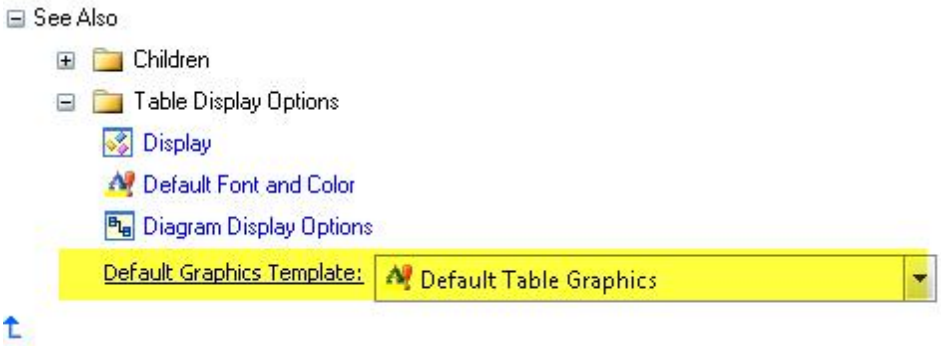


Default Table Graphics

When a Table is included in a Diagram, ModelRight 4.0 will use this setting to determine how it will be displayed. This is useful if you always want a Table to be displayed a certain way (i.e. with certain fonts and colors) when it is included in a Diagram. This capability has been added for Tables, Views, Columns, and Relations.



The Default Graphics control on the Table page of the Property Browser.

User Defined Icons

ModelRight 4.0 lets you import your own icons to be used when drawing the Table (or Column) in a Diagram.

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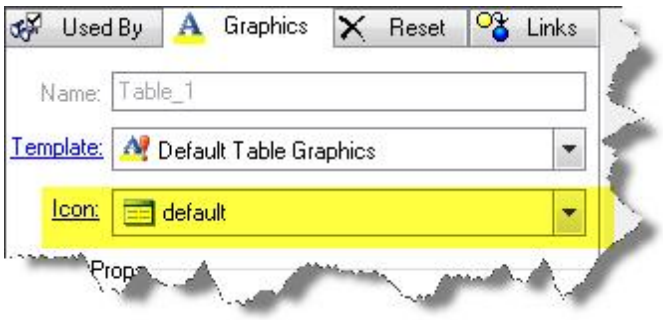

Model Templates

You can use this control in the File/New and Database/Reverse Engineer dialogs to let you create a new Model based on an existing Model. Use the Browse button to select the Template Model that you want to use.

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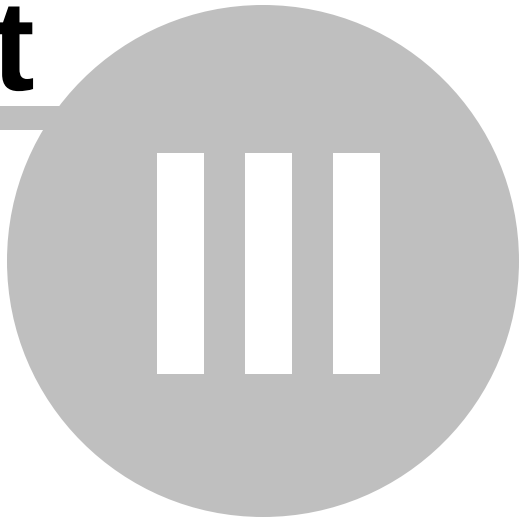
Part



3 User Interface

The various User Interface elements work together to provide an innovative, intuitive and natural work environment. There's no need to constantly pop up different dialogs and hit Ok just to make a change. Simply select the object you want to edit - either from the Model Explorer or Diagram - and change its properties in the Property Browser. With unlimited Undo, if you make a mistake, you can always undo it. View the full impact of any changes in the Transaction History window.

ModelRight provides a Shortcuts toolbar, Model Explorer, Diagram(s), Property Browser, Diagram Navigator, Modeless Database Compare window, Transactions window, Find Results window, and a Validation Results window.

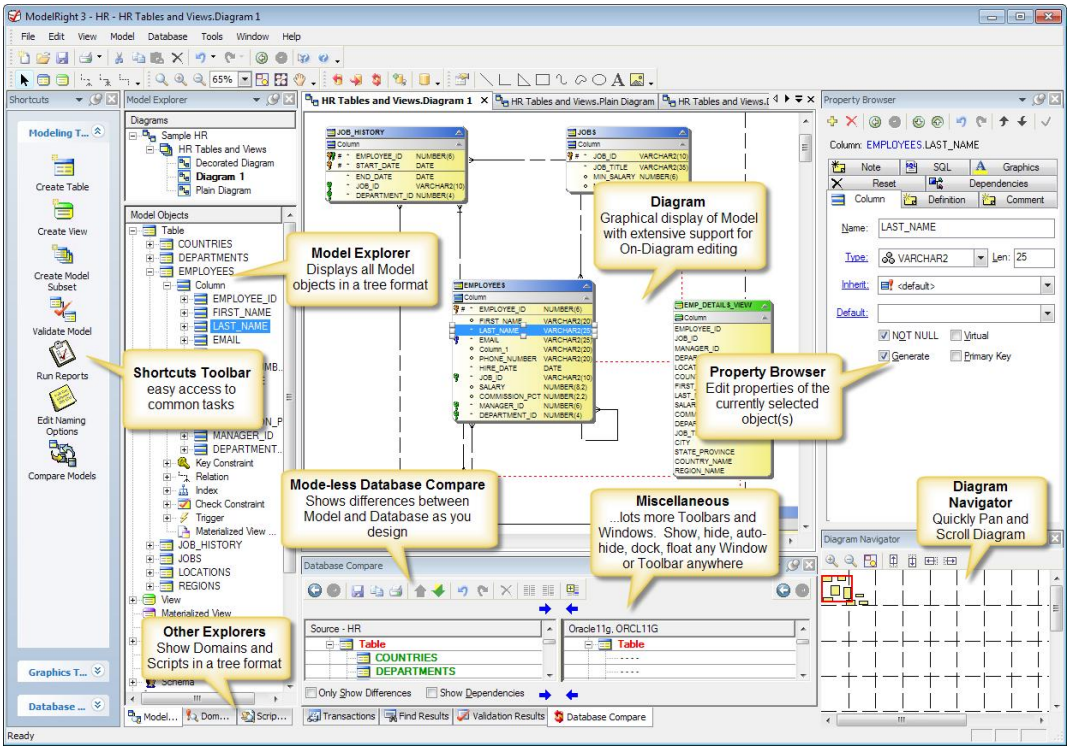


Diagram
Graphical display of Model with extensive support for On-Diagram editing
Model Explorer
Displays all Model objects in a tree format
Shortcuts Toolbar
easy access to common tasks
Property Browser
Edit properties of the currently selected object(s)
Mode-less Database Compare
Shows differences between Model and Database as you design
Miscellaneous
...lots more Toolbars and Windows. Show, hide, auto-hide, dock, float any Window or Toolbar anywhere
Diagram Navigator
Quickly Pan and Scroll Diagram
Other Explorers
Show Domains and Scripts in a tree format

This screenshot illustrates the various elements of the ModelRight User Interface.

3.1 Explorers

ModelRight 4.0 has three different Explorers - the Model Explorer, the Templates Explorer, and the Scripts Explorer. Each Explorer displays different different types of Model objects in a tree format. When you select an object in an Explorer, its properties will be displayed in the Property Browser. If you select a category, like Table, Type, Tablespace, etc... the category editor will be displayed in the Property Browser. If possible, the selected object will also be selected in the current Diagram.

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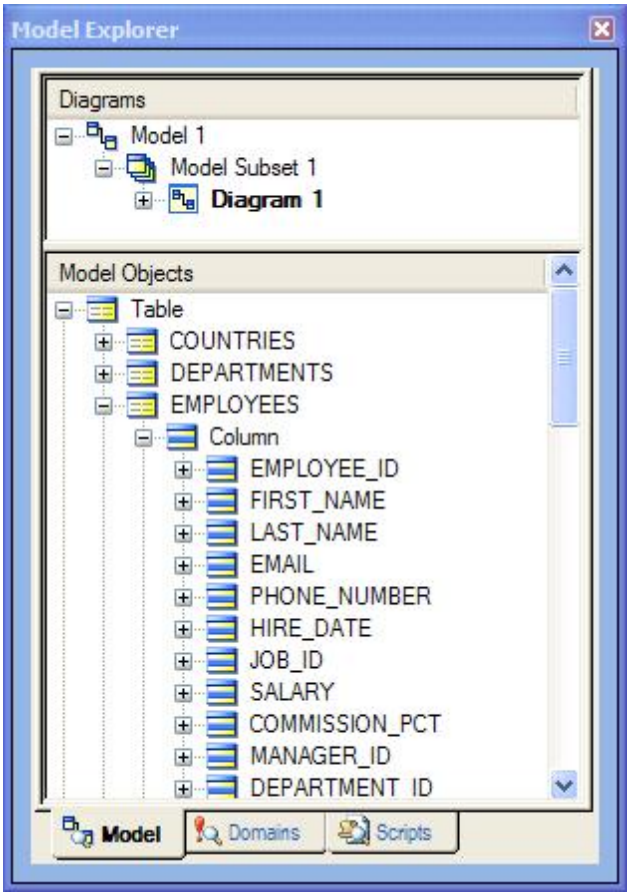
The Explorers can be docked together (as illustrated below) or separately. To dock an Explorer (or any toolbar) separately, turn Auto-Hide off and then drag the tab.



The Model Explorer

The Model Explorer displays most of the ModelRight types of objects. It is divided into two sections - Diagrams and Model Objects. The Diagrams section is provided primarily to display and edit the graphical portions of the model. It contains entries for the Diagrams, Model Subsets, and the Model itself. The Model Objects section displays the basic types of modeling and Oracle objects. i.e. Tables, Views, Columns, etc...

The Model Explorer is a fundamental component of the design environment. It gives you a tree/folder oriented perspective into your Model that is compact and complete. Explorer Folders are similar to the common notion of a file directory. They act as containers for either other Explorer Folders or leaf-level items - in this case "Explorer Lists". An Explorer List allows you to view a list of objects of some type. ModelRight automatically creates Explorer Lists for all of your top-level database objects like Tables, Views, etc... Now with ModelRight 4.0 you can create your own Folders and Lists. A list can be of a top-level object type like Tables or of a secondary-level (or tertiary, etc) type of object like Key Constraint (secondary because its always owned by a Table). At each level, you can either include all objects or restrict the included objects by specifying a "Filter" - some condition/criteria that needs to be satisfied for inclusion. ModelRight 4.0 will then automatically add/remove objects from the list depending on whether or not they satisfy the Filter condition.

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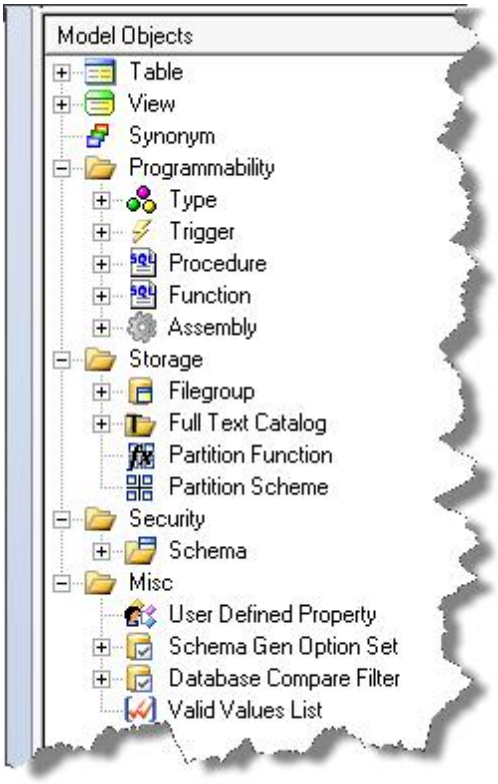
ModelRight 4.0 provides the capability to create and organize your "Explorer Folders" any way you want. We provide a default organization as shown below, but you can move "Explorer Folders" and "Explorer Lists" around by drag/dropping or using the Move Up/Down toolbar buttons to create the Folder organization that you want.



Example of default Folder and List organization (for SQL Server)

Just as Explorer Folders are similar the notion of a directory folder, "Explorer Lists" are similar to a file. An Explorer List allows you to view a list of some type of object. ModelRight automatically creates Explorer Lists for your basic database objects like Table, View, etc... Now with ModelRight 4.0 you can create your own. The list can be of a top-level object like Tables or of a secondary-level (tertiary, etc) type of object like Key Constraints (secondary because its always owned by a Table). At each level, you can include all objects or restrict the included objects by specifying a "Filter" (some condition/criteria) that needs to be satisfied. ModelRight 4.0 will then automatically add/remove objects from the list depending on whether or not they satisfy the Filter condition. ModelRight 4.0 provides a Explorer List Wizard to help you create and edit basic Explorer Lists. You can also use the Property Browser page to create and edit them more manually.

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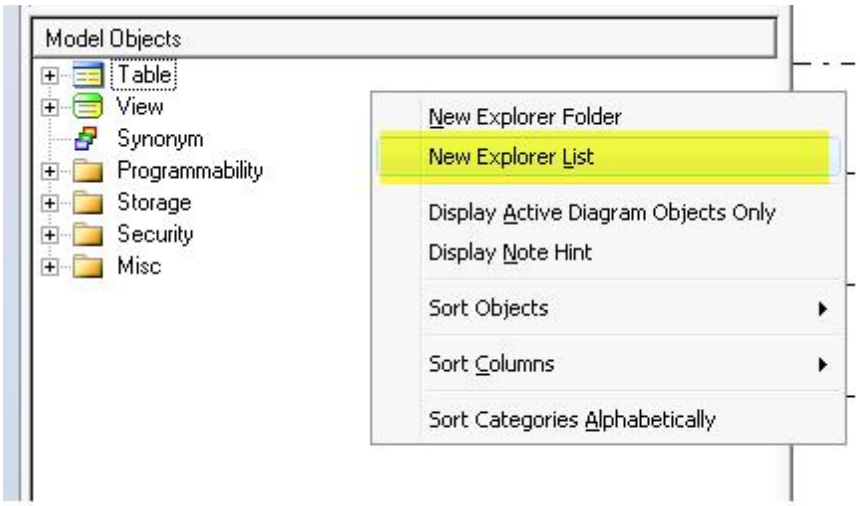
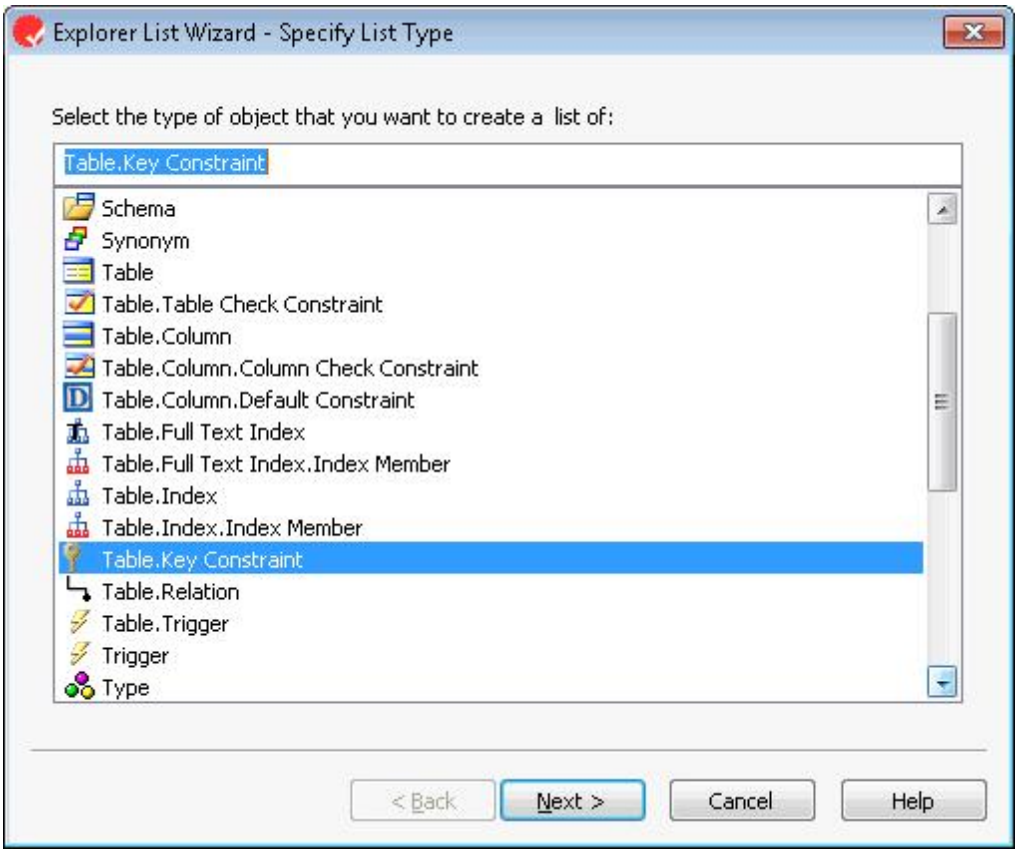


The context menu that is displayed when you right click on the Model Explorer background. Select New Explorer List to run the Explorer List Wizard.



First step is to select the type of object that you want to make a list of. In this case, we chose to make a list of Key Constraints.

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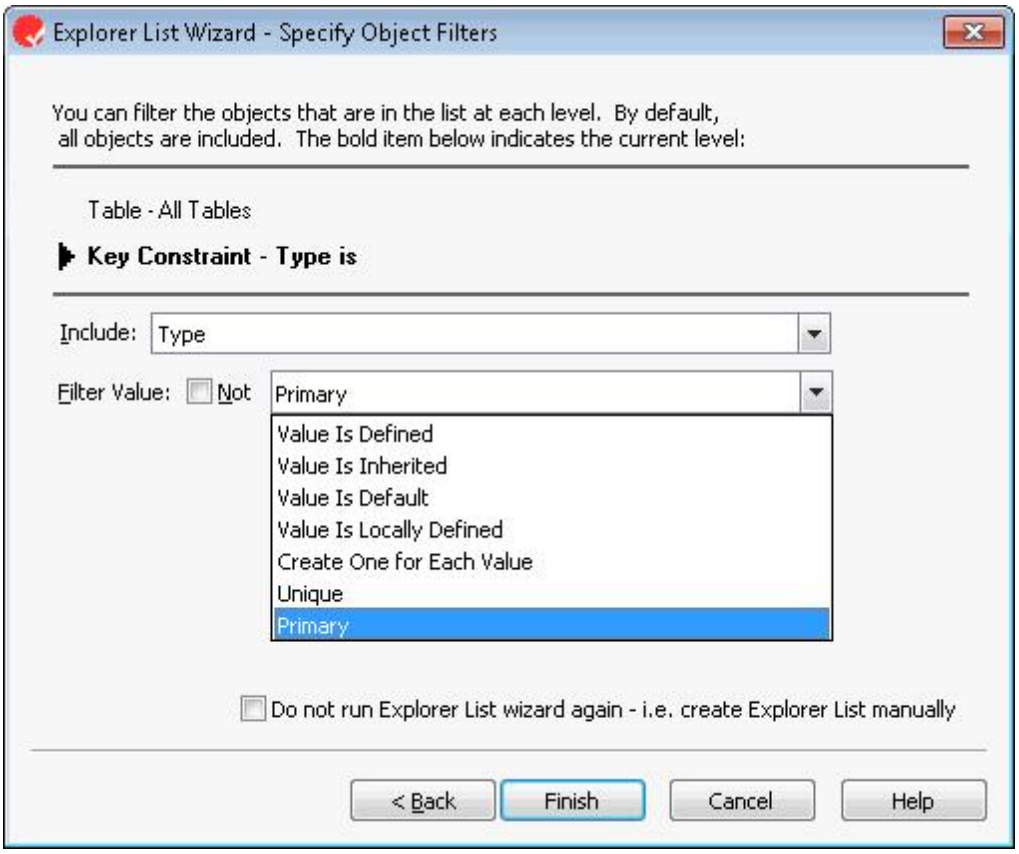
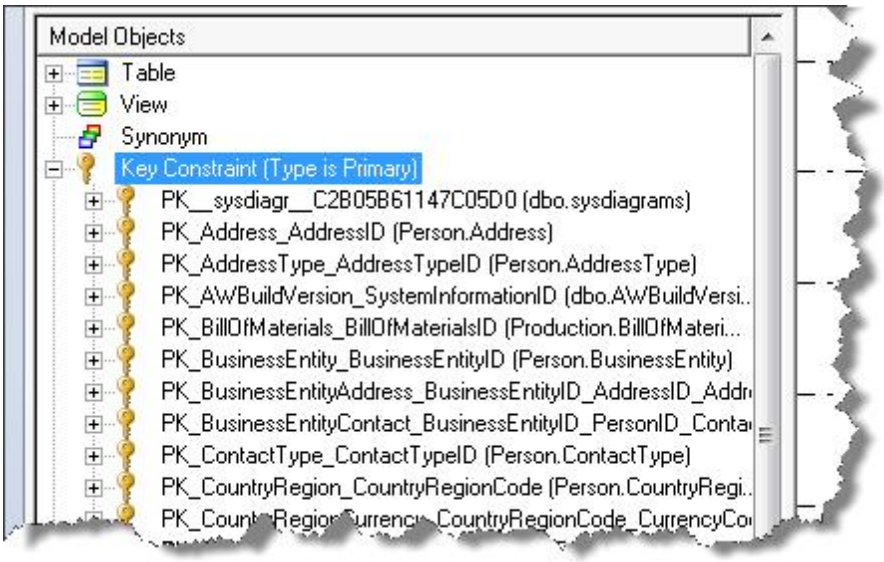

Explorer List Wizard - Specify Object Filters
You can filter the objects that are in the list at each level. By default, all objects are included. The bold item below indicates the current level:
Table - All Tables
Key Constraint - Type is
Include: Type
Filter Value: Not Primary
Value Is Defined
Value Is Inherited
Value Is Default
Value Is Locally Defined
Create One for Each Value
Unique
Primary
Do not run Explorer List wizard again - i.e. create Explorer List manually
< Back
Finish
Cancel
Help

Then optionally specify a filter for each level. In this case, no filter is specified at the Table level (so all Tables are used) and a Filter to only display Primary Key Constraints is specified at the Key Constraint level.



Example of what the Model Explorer looks like after the new Explorer List was created.

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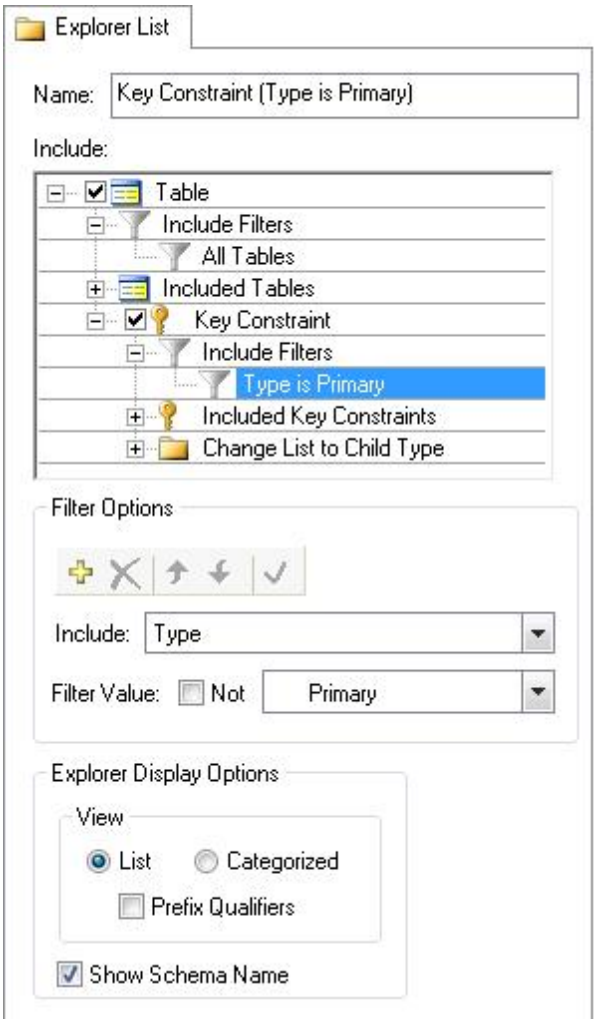

The Property Browser page that is displayed when the Explorer List is selected. You can edit the Explorer List using this as well. You can also re-run the Explorer List Wizard to edit the Explorer List.

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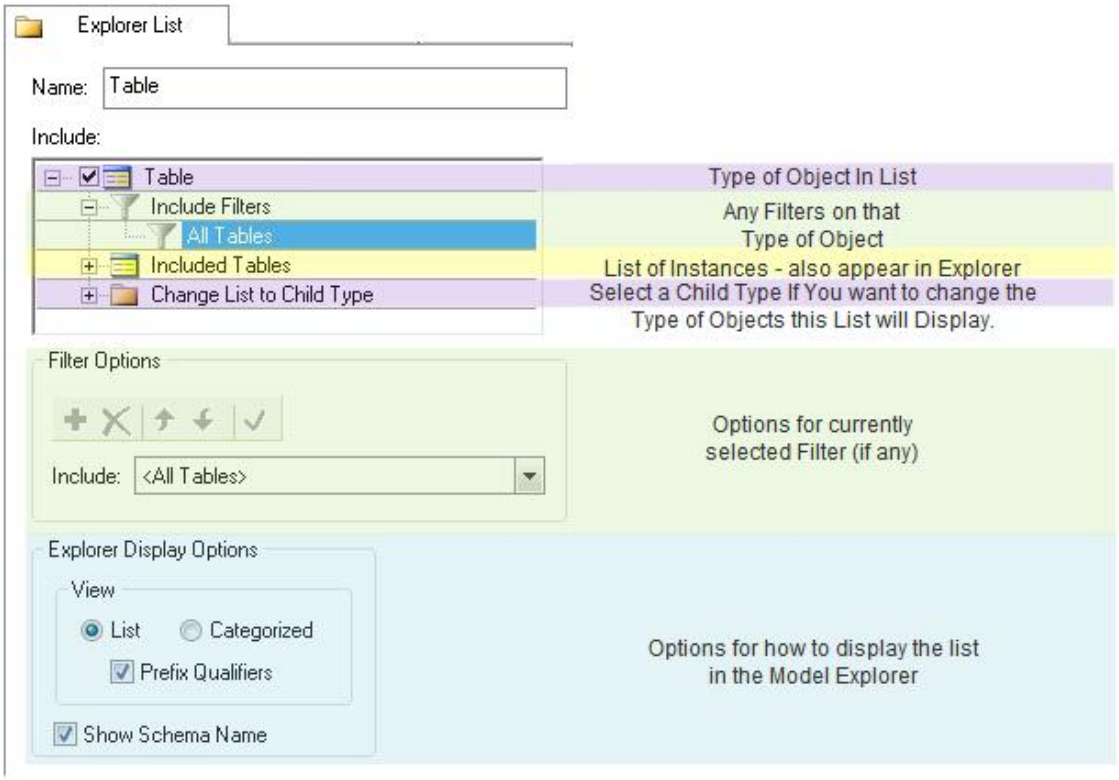
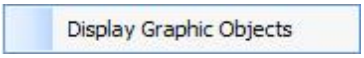


The components of the Explorer List Property Page.
1) the type of object
2) any filters on the object type
3) a list of object instances
4) repeat

If you right click on an object in the Model Explorer you will get a context menu with various actions you can take on that object or tree item:

If you right click on the background of the upper section of Model Explorer you will get a different context menu. This option is also available in the **Tools->Options** dialog. This menu contains a **Display Graphic Objects** option. This option toggles the display of the Graphic Objects that are contained in the Diagram(s). A Graphic Object is created for each object that is displayed in the Diagram. The purpose of the Graphic Object is to hold options for how the object is displayed in the Diagram - i.e. its font, color, position, etc..



The context menu that is displayed when the background of the Diagrams tree is right-clicked.

If you right click on the background of the lower section of Model Explorer you will get a different context menu.

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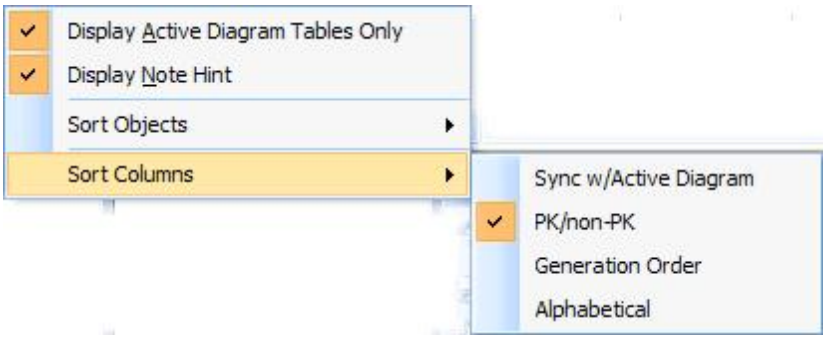


The context menu that is displayed when the background of the Model Objects tree is right-clicked.

Display Active Diagram Tables Only - if turned on, the Model Explorer will display only those Tables/Views that are in the currently active Diagram. If no Diagram is active, then all Tables/Views will be displayed.

Display Note Hint - If an object has a Note, then an asterisk will be displayed after the object's name.

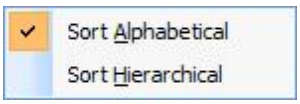
Sort Objects - Determines how objects that are displayed in the Model Explorer are sorted. Choose between sorting Alphabetically or by Generation Order. Generation Order is usually the order in which the objects were created. In the case of Tables/Views, the Generation Order is dynamically determined based on the Relations between the Tables - so the Tables are always listed Alphabetically.

Sort Columns - determines how Columns, View Columns, and Attributes that are displayed in the Model Explorer are sorted. Choose between Sync with Active Diagram, Pk/Non-Pk, Generation, and Alphabetical ordering.

Templates Explorer

The Templates Explorer displays all of the built-in and user-defined Template objects. See Templates for a detailed description of what Templates are and how to use them.

If you right-click on the background of the Templates tab, the following context menu will be displayed:



Sort Alphabetical - specifies that the default display option for how Templates are displayed in this tree is Alphabetically. The default option can be overriden by chosing from the context menu of a specific Template type.

Sort Hierarchical - specifies that the default display option for Templates are displayed in this tree is Hierarchically - based on the inheritance relations between the Templates.

You can override the default display option for a particular type of Template by right-clicking on the Template's category and changing it using the displayed context menu.

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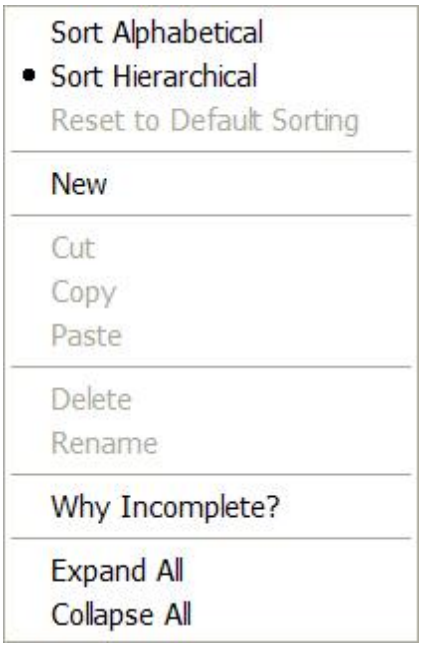
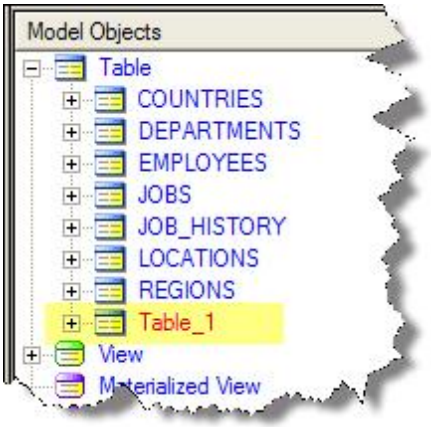


Scripts Explorer

The Scripts Explorer contains all of the built-in and user-defined Script objects. Scripts are primarily used for generating DDL from your model objects, but they can be used for other purposes as well. See the Scripts section for more details.

Incomplete Objects

If an item is displayed in red, then it is somehow incomplete and can not be generated to the database. For example, if you plop down a new Table, it will initially be incomplete because it does not yet have any Columns:



If you right click on the Table and select the **Why Incomplete** menu item

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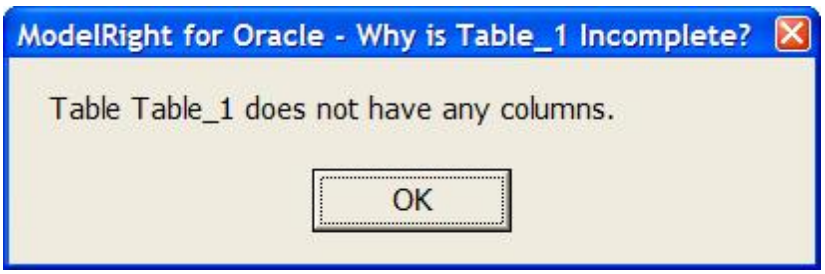
If you select it, ModelRight will display a dialog with information about why the object is incomplete:



Incomplete object can also be found by running the Model Validate feature.

3.2 Property Browser

In ModelRight, The Property Browser is used to edit the properties of the currently selected object (in this case a Column). If the Property Browser is not currently displayed, you can display it by selecting the Edit/Properties menu option. F4 toggles the display of the Property Browser. See the Property Pages section for a description of some of the more common or important Property Pages.

The Property Browser contains the following components:

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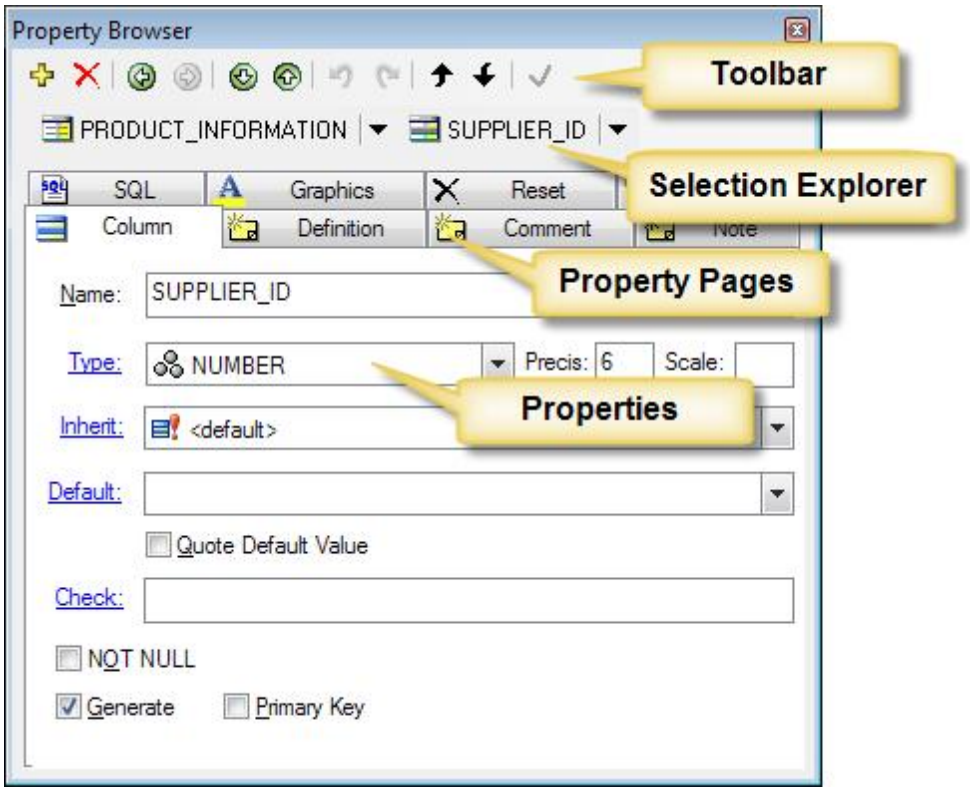

This screenshot illustrates the elements of the Property Browser - the Toolbar, Path Navigator, Property Pages/Tabs, and Properties.

Toolbar

- **Create New Object -** creates another object of the same type as what is currently selected. For example, if a Column is currently selected, then clicking this button would create another Column and change the current selection to the newly created column.
- **Delete** - delete the currently selected object(s)
- **Previous Selection -** makes the previously selected object the current selection. Changing the selection does not change the underlying model.

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- **Next Selection -** if Previous Selection is clicked, then this button becomes enabled to allow you to navigate forward from your previous selection(s).
- **Select Next Sibling -** makes the next sibling object the current selection.
- **Select Previous Sibling -** makes the previous sibling object the current selection.
- **Undo -** undo your last action. This action might not be related to the currently selected object, but its provided here for your convenience.
- **Redo -** if you Undo any actions, then this button becomes enabled to allow you to re-do your undone actions.
- **Move Object Up In Order -** if the currently selected object's order can be changed, then this button is enabled to allow you to move the object up in its sibling order. For example, if a column is selected, then clicking this button will move the column up in the logical or physical/generation order (depending on what the Model Explorer's Sort Columns option is set to). Tables and Views are always displayed in alphabetical order since their generation order is dynamically determined based on their relations. Hence, their order can not be changed with this button.
- **Move Object Down In Order -** same as above button, except it moves the object down in the order.
- **Commit -** becomes enabled when you change text in an edit control. It just provides a place for you to click so that the edit control loses focus and commits your changes.

Selection Explorer

The Selection Explorer lets you quickly view and navigate to objects that are related to the current selection. It displays the name of the currently selected object and all of its owners. You can click any owner to navigate to it - i.e. make it the currently selected object. You can also click on the drop-down control next to each name to display a menu of that object's child types and children. Selecting an item from this menu will cause ModelRight to navigate to that object. Ctrl+Clicking on a child type will cause ModelRight to create a new object of that type and navigate to it.

In the screenshot below, clicking on PRODUCT_INFORMATION will make that table the currently selected object and show its properties.

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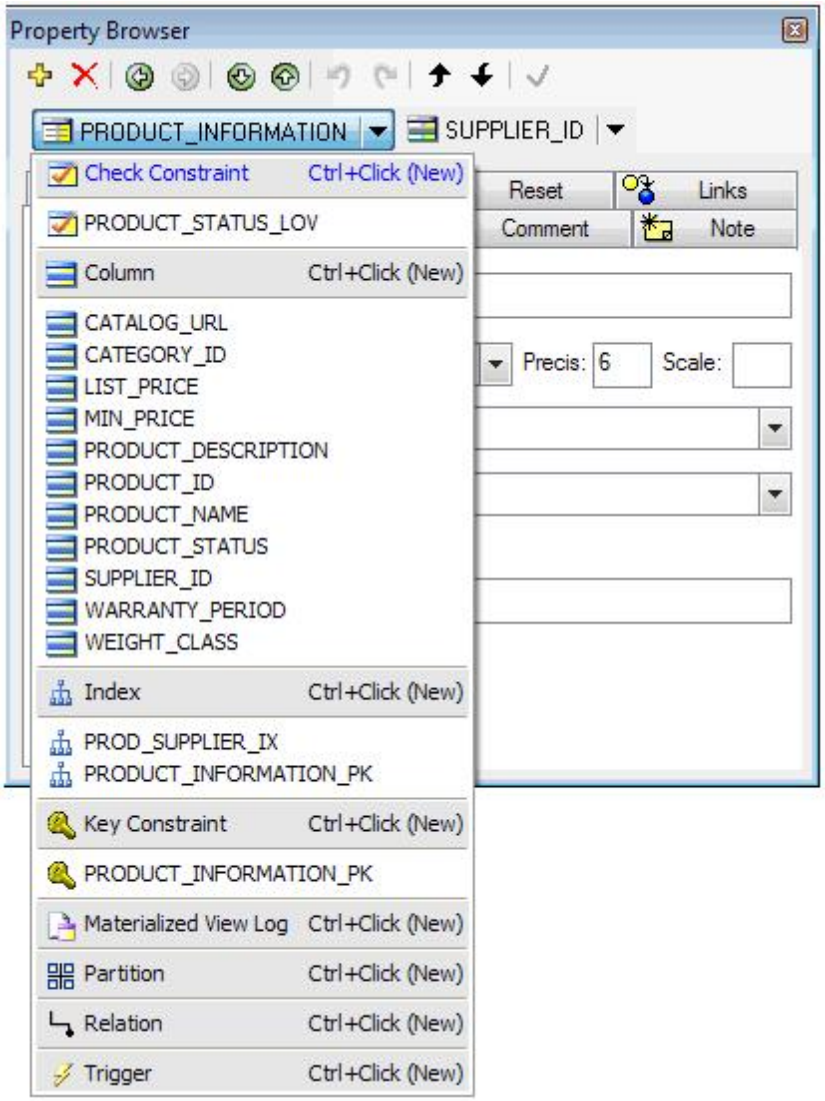

Illustration of the menu that is displayed when a drop-down control is clicked.

Tabs

Standard tab controls are used to separate the different types of properties.

Properties

Each tab contains various types of controls to allow you to change the selected object's properties.

Create and Attach Shortcut

ModelRight has always allowed easy navigation to related objects via its unique hyperlinked User Interface. Now you can create, attach, and navigate all in one click. For example, if you are editing a Table and want to assign it to a new Tablespace, all you have to to is hold the

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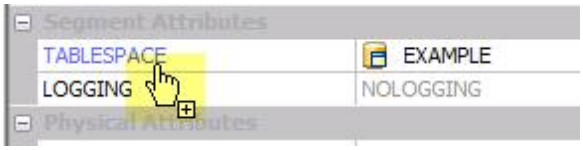
Control key down and click on the Tablespace Hyperlink - as illustrated below. When you Ctrl +Click on a hyperlink in the Property Browser, ModelRight will create a new object of the type of the hyperlink, attach it to the currently selected object, and change the selection to the newly created object.



3.3 Windowing Features

Toolbar Docking

ModelRight 4.0 has improved window and toolbar handling.

When you drag the top of a toolbar (like the Explorers, Property Browser and Output Window), docking hints will be displayed to show you where the toolbar will be placed when the drag ends. You can specify subtle changes in the toolbar placement by dragging it over the docking hints.

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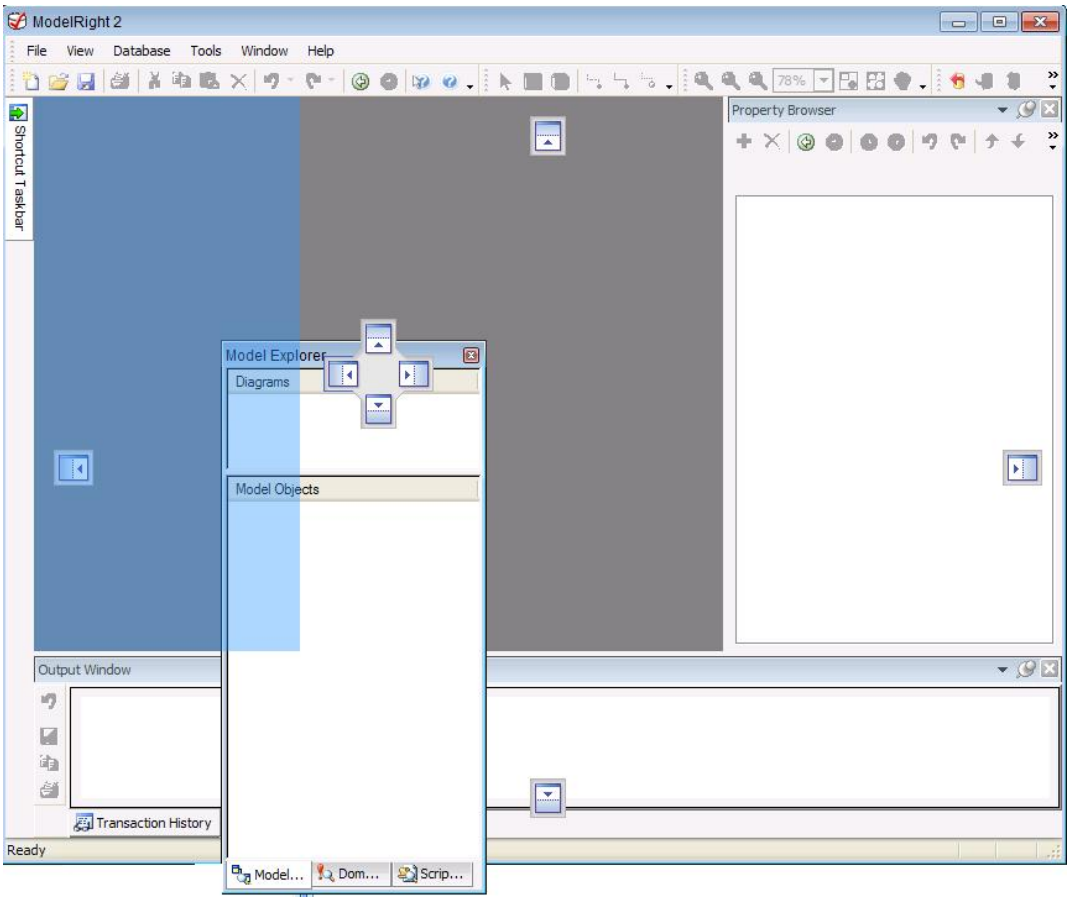

Illustrates the docking hints that are displayed when a toolbar is dragged.

Also, you can dock any toolbar with any other toolbar. By default all of the Explorer toolbars are docked together, but you could separate them and dock them by themselves or with any other toolbar:

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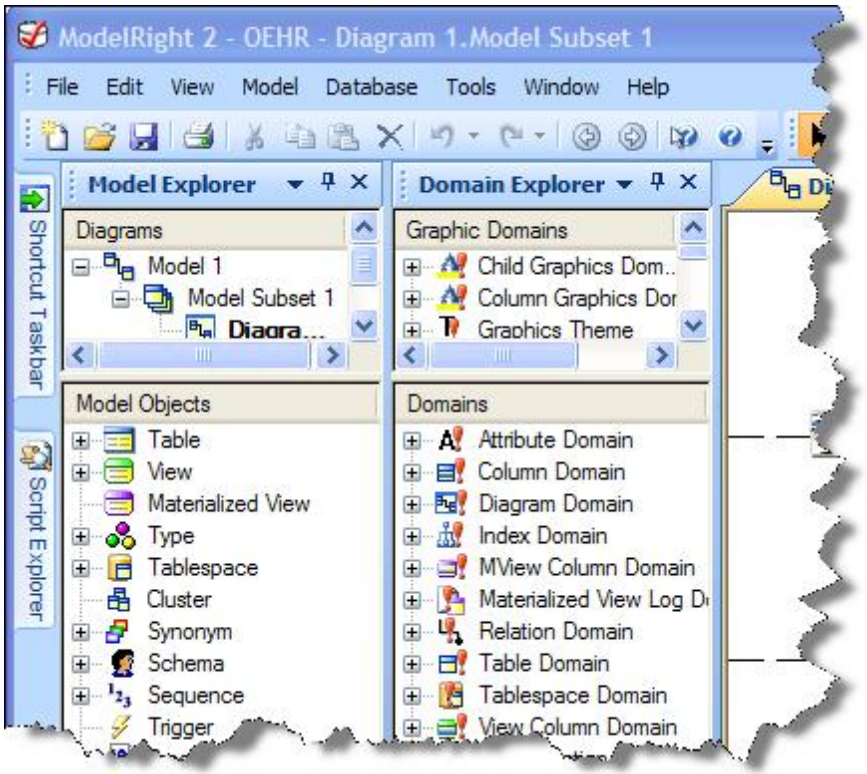

Illustrates a different docking configuration in which the Model, Domain, and Script Explorers are docked separately. And the Shortcut Taskbar and Script Explorer are Auto-Hidden.

Auto-Hide

The toolbars now have an Auto-Hide option to keep them from taking up screen space till they are needed. When they are not needed the are hidden on the side of the application and a tab is displayed instead. When you want to use the Toolbar, simply move the cursor over it and it will re-appear.

The Auto-Hide option is located in the upper-left corner of th toolbars.

Diagram Selection Dialog

A helper dialog is displayed when you hit Ctrl+Tab to help you select a Diagram or toolbar to display. You can either tab through the selections or click on the one you want.

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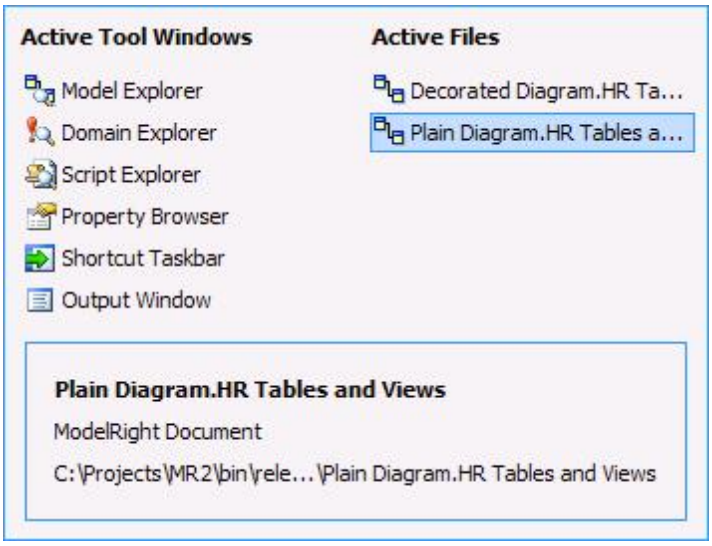

Illustrates the Diagram selection dialog that appears when you hit Ctrl+Tab

Windows Styles and Skins

Style and Skins options have been added to the Windows Menu.

- Skins effect the overall look, feel, and color of the framing windows used by ModelRight 4.0.
- Styles fine-tune the fonts and look of the Skin and usually just change the window icons.

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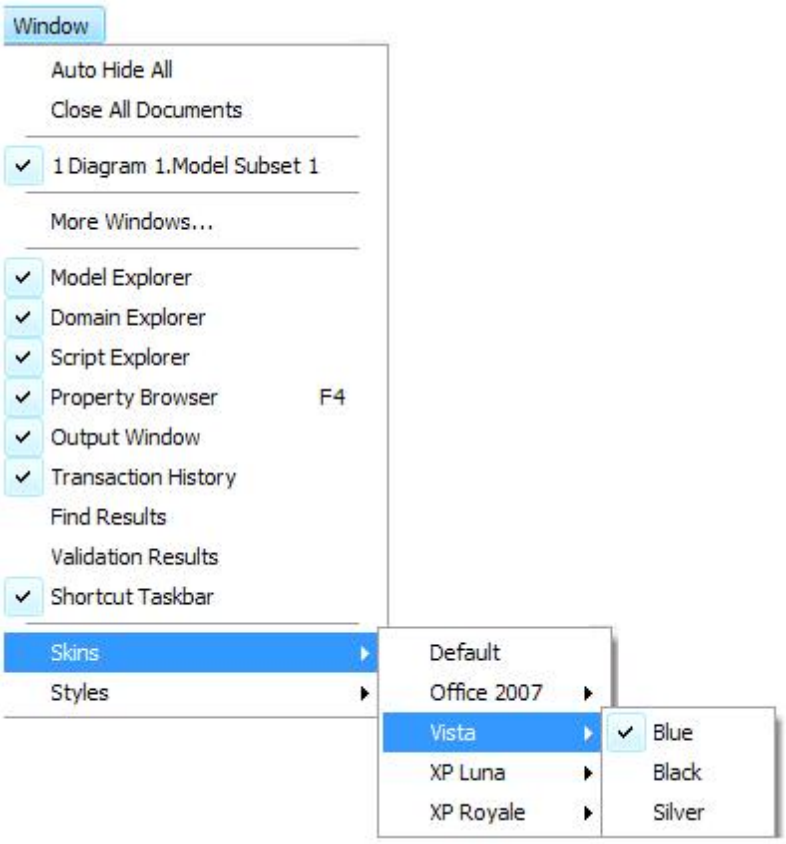

Play around with these options to find the combinations of Window Style and Skin that you like most.

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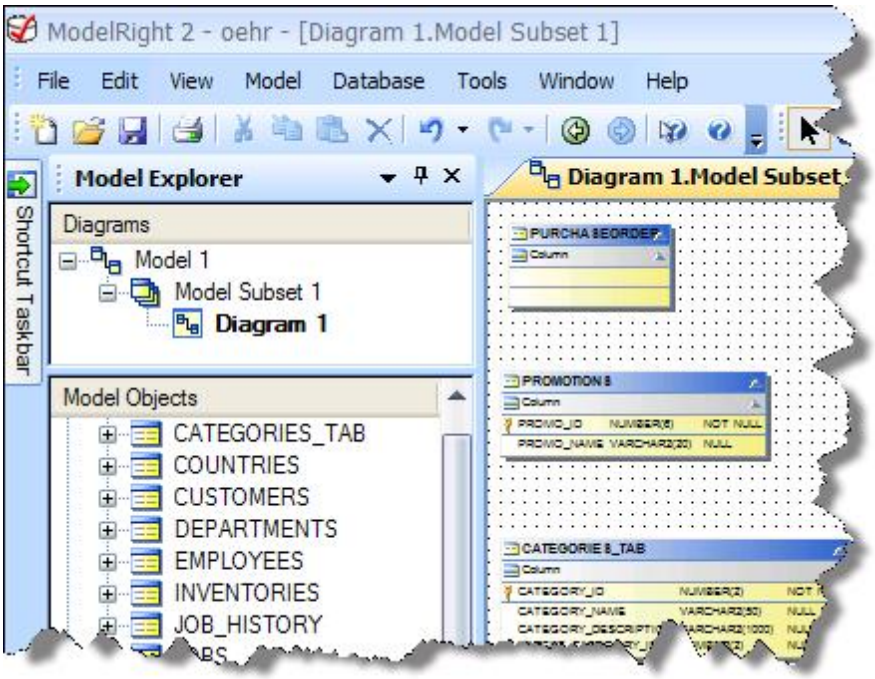
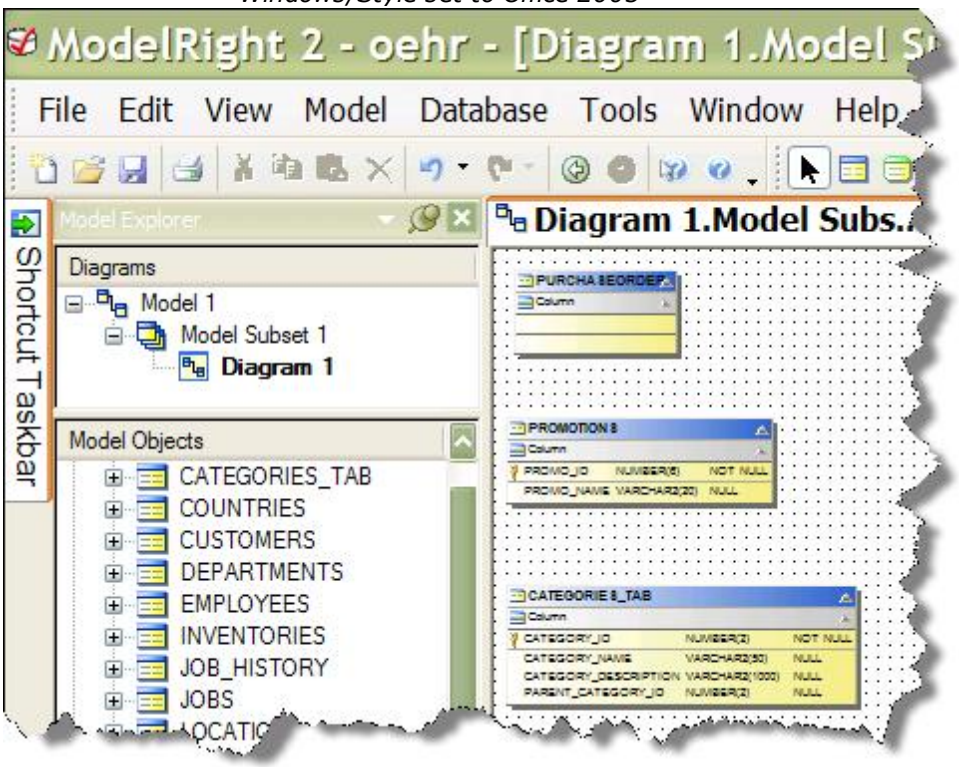


Screenshot with Windows/Skin set to Office 2007/Blue and Windows/Style set to Office 2003



Screenshot with Skin set to XP Luna/Extra Large Homestead and Style set to Native XP

Create and Attach Shortcut

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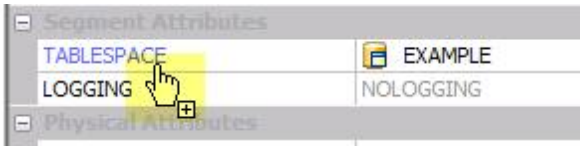
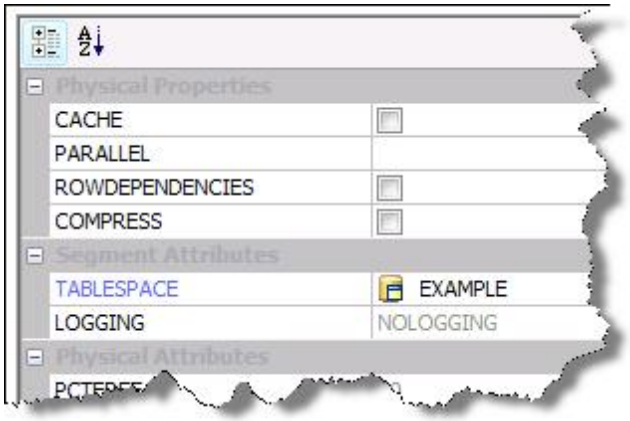
ModelRight has always allowed easy navigation to related objects via its unique hyperlinked User Interface. Now you can create, attach, and navigate all in one click. For example, if you are editing a Table and want to assign it to a new Tablespace, all you have to to is hold the Control key down and click on the Tablespace Hyperlink - as illustrated below. When you Ctrl+Click on a hyperlink in the Property Browser, ModelRight will create a new object of the type of the hyperlink, attach it to the currently selected object, and change the selection to the newly created object.

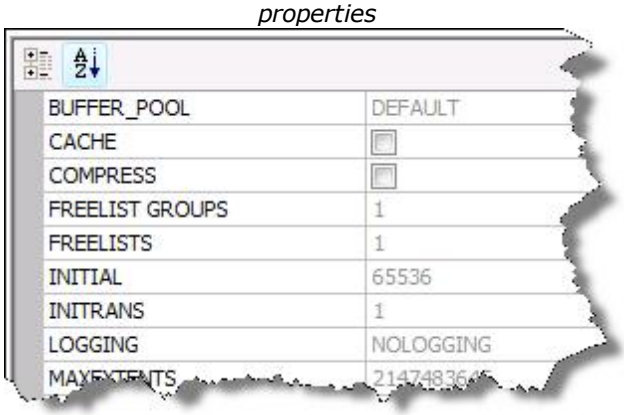


Property Grid

The Property Grid has options for displaying by Category or Alphabetically



The new property grid displaying categorized properties



The property grid the properties sorted alphabetically

Multiple Selection

ModelRight now supports the selection and editing of multiple Tables at the same time. This is useful when you want to change a property of the selected Tables all at once. The

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Table, Physical, SQL, Reset, and Graphics pages have been this enhanced with this capability.

Print Scaling

In ModelRight, you can simply drag the page boundaries that are displayed on the Diagram to change the print scale. i.e. how much is printed on a page. When the mouse rolls over a page boundary, the cursor changes as illustrated below. You can then select and drag the page boundaries. You can also set the scaling by entering a scale factor in a Diagram's Grid property page. Page Setting such as Landscape mode and Page sizing info are also saved.

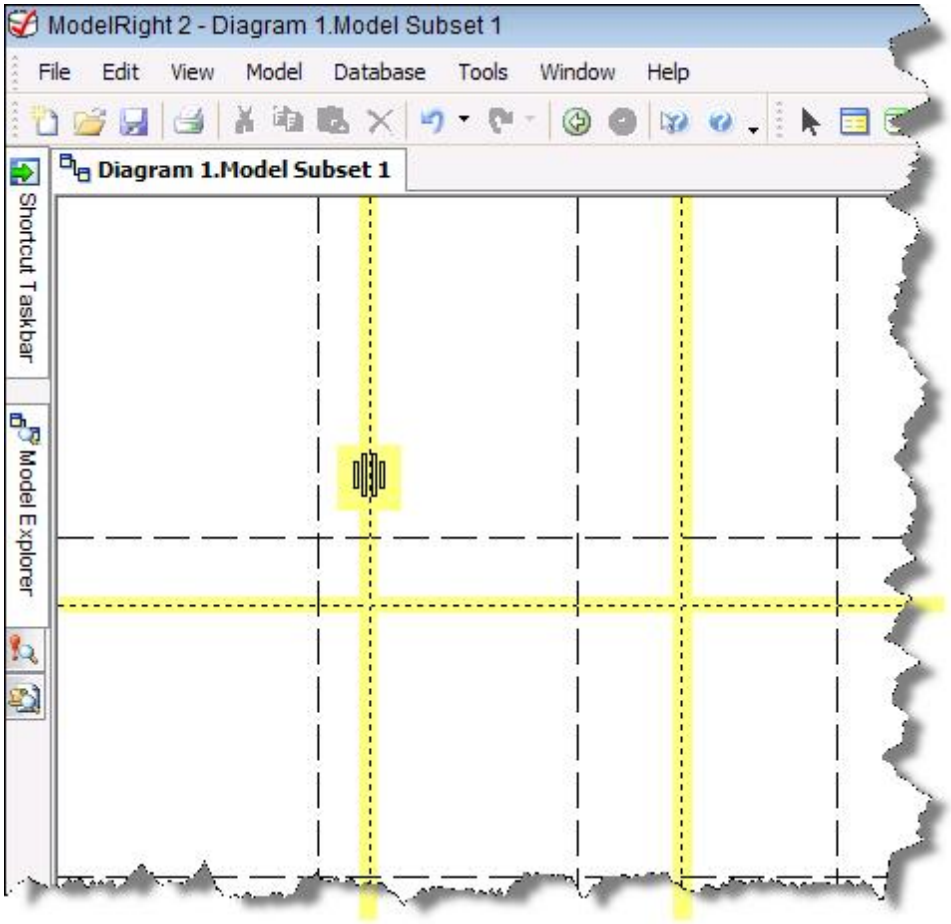

Illustration of dragging the page boundaries. The highlighted lines show the dragged/new page boundaries. Notice the cursor change.

3.4 Diagrams

A Diagram displays a view of Tables, Views, Materialized Views, various kinds of Relations and simple graphic objects - like rectangles, circles, lines.. Which Tables and Views are displayed is determined by the Model Subset that owns the Diagram. A Model Subset is used to specify a subset of all of a Model's Tables and Views - allowing you to organize the display of your Tables/Views in whatever way you want.

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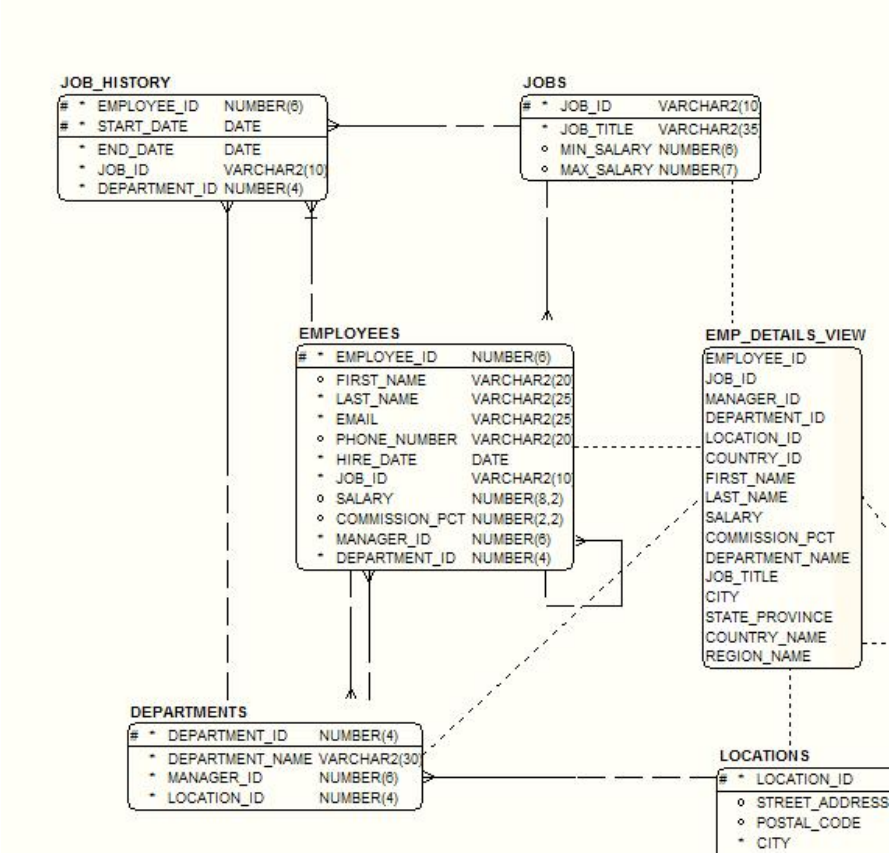
ModelRight provides an amazing variety of ways to display your Model. The following two Diagrams illustrate this variety. Both Diagram are contained in the same Model Subset (so they have the same Tables/Views) and use the same Notation (Barker), but they have very different display options: Themes allow you to change the look of a Diagram with a single click.



A Diagram with its Diagram Display and Table Graphic options set to plain black and white options.

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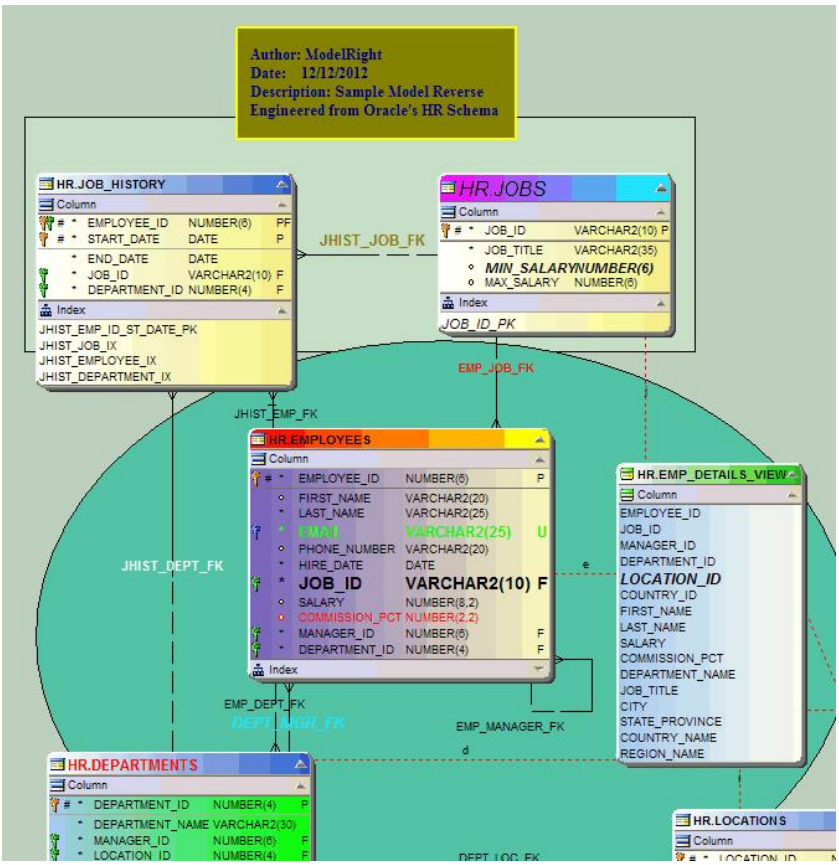
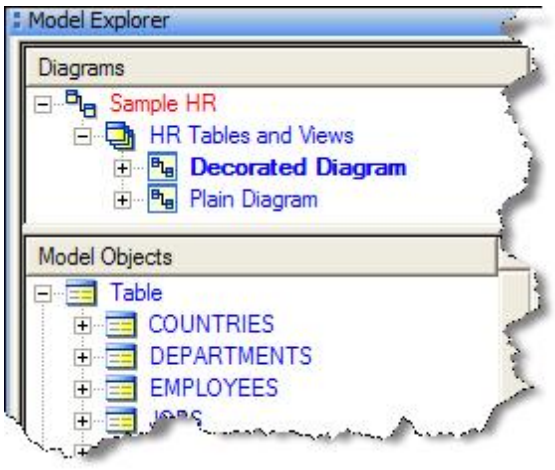


The same set of Tables/Views and notation (Barker) displayed with more colorful display options.

The Diagrams and Model Subsets are displayed at the top of the Model Explorer. To open a Diagram either double-click on it or right click and select Open in the context menu.



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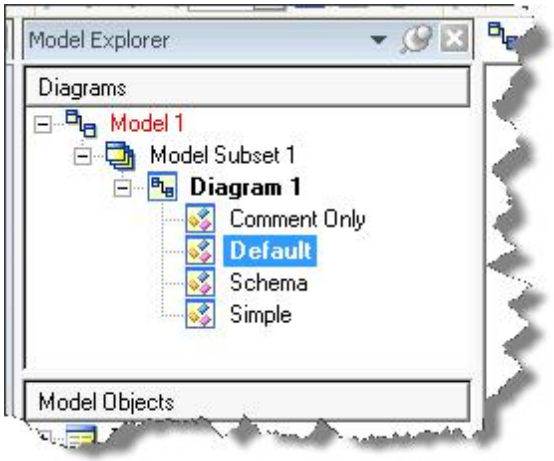
3.4.1 Content Display Options

ModelRight 4.0 uses "Content Display" objects to store and let you easily switch between your different sets of display options. A Diagram can have any number of Content Displays to let you quickly change the displayed information of the Diagram's objects (i.e. tables, views, etc). Content Display objects are displayed under the Diagram object in the Model Explorer.



The Diagrams section of the Model Explore lists the Content Display options that you currently have defined. Select it to edit or double click to select and activate.

A Diagram has one active Content Display at a time. You can activate a Content Display by double clicking on it in the Explorer or by changing it from the Diagram's property page. As with anything else, when you select a Content Display in the Model Explorer, its properties are displayed in the Property Browser:

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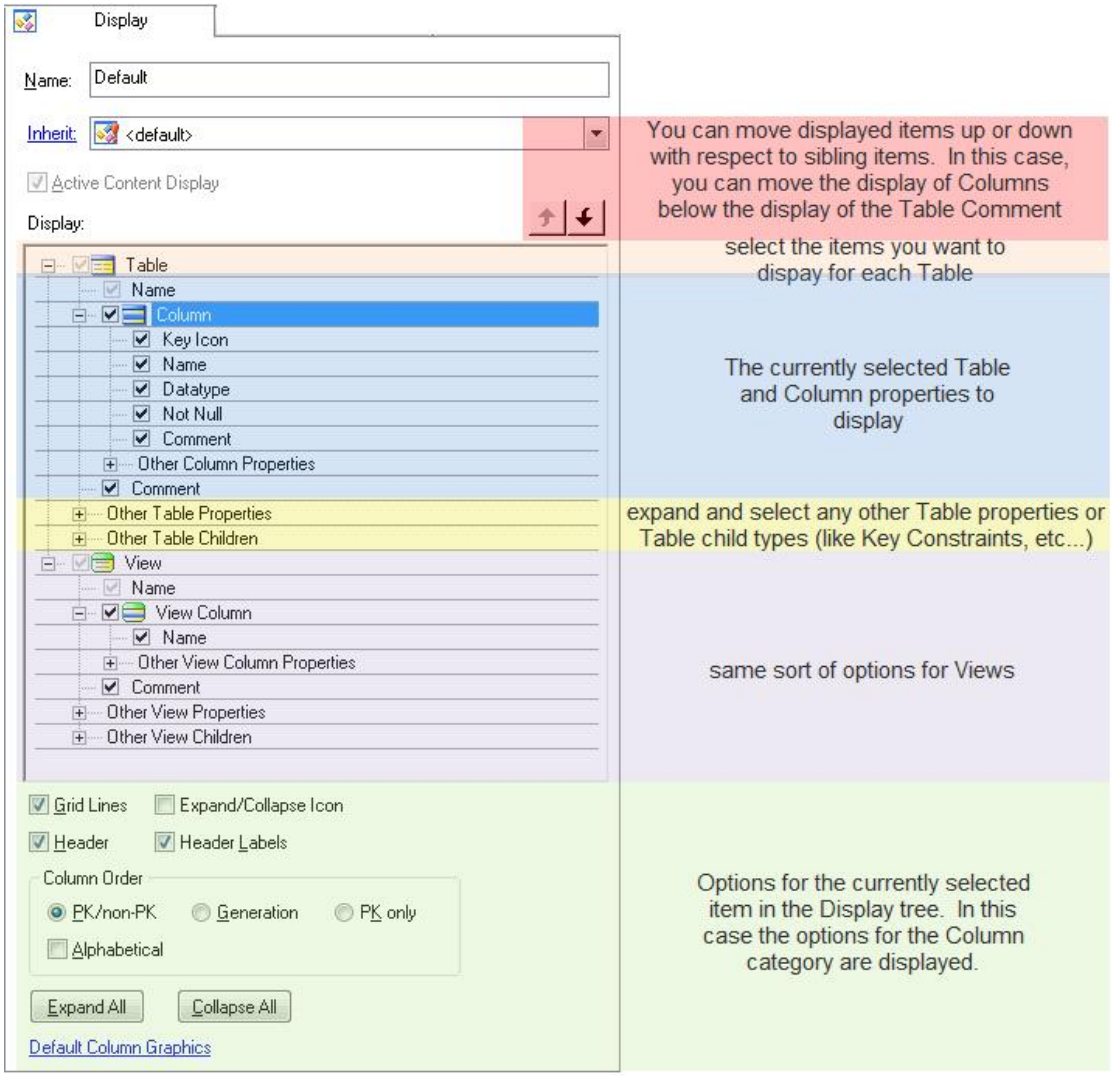

The Content Display edit controls in the Property Browser.

Click around on the tree items to see the options that are available for the selected item.

ModelRight 4.0 provides unprecedented levels of control and flexibility when it comes to your Diagram's display. With a wealth of new and useful display options, you can display and edit any kind of object and any property on the Diagram. You simply select the properties, the types of objects that you want to included in your diagram - and order them any way you want.

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Sales.SpecialOffer

Column	Datatype	NN	Comment
SpecialOfferID	int	☑	Primary key for SpecialOffer records.
Description	nvarchar(255)	☑	Discount description.
DiscountPct	smallmoney	☑	Discount precentage.
Type	nvarchar(50)	☑	Discount type category.
Category	nvarchar(50)	☑	Group the discount applies to such...
StartDate	datetime	☑	Discount start date.
EndDate	datetime	☑	Discount end date.
MinQty	int	☑	Minimum discount percent allowed.
MaxQty	int	☐	Maximum discount percent allowed.
rowguid	uniqueidentifier	☑	ROWGUIDCOL number uniquely i...
ModifiedDate	datetime	☑	Date and time the record was last ...

Sale discounts lookup table.

An example of the default Table display

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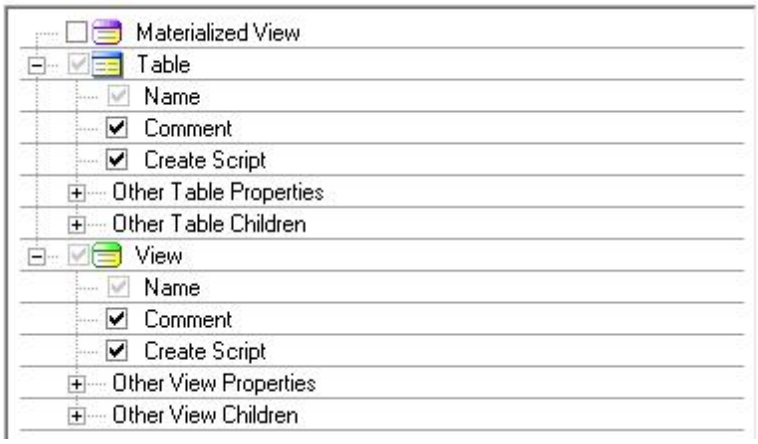
Example 1



Example of display option settings to show only the Table Comment and Create Script

HR.EMPLOYEES

employees table. Contains 107 rows. References with departments, jobs, job_history tables. Contains a self reference.

```
---
--- CREATE TABLE: HR.EMPLOYEES
---
CREATE TABLE HR.EMPLOYEES
(
    EMPLOYEE_ID NUMBER(6) NOT NULL,
    FIRST_NAME VARCHAR2(20),
    LAST_NAME VARCHAR2(25) CONSTRAINT EMP_LAST_NAME_NN NOT NULL,
    EMAIL VARCHAR2(25) CONSTRAINT EMP_EMAIL_NN NOT NULL,
    PHONE_NUMBER VARCHAR2(20),
    HIRE_DATE DATE CONSTRAINT EMP_HIRE_DATE_NN NOT NULL,
    JOB_ID VARCHAR2(10) CONSTRAINT EMP_JOB_NN NOT NULL,
    SALARY NUMBER(8,2)
        CONSTRAINT EMP_SALARY_MIN CHECK (salary > 0),
    COMMISSION_PCT NUMBER(2,2),
    MANAGER_ID NUMBER(6),
    DEPARTMENT_ID NUMBER(4),
    CONSTRAINT EMP_EMP_ID_PK PRIMARY KEY (EMPLOYEE_ID)
        USING INDEX
            STORAGE
            (
                NEXT 1M
            ),
    CONSTRAINT EMP_EMAIL_UK UNIQUE (EMAIL)
)
    TABLESPACE EXAMPLE
```

And the resulting Table display

Example 2

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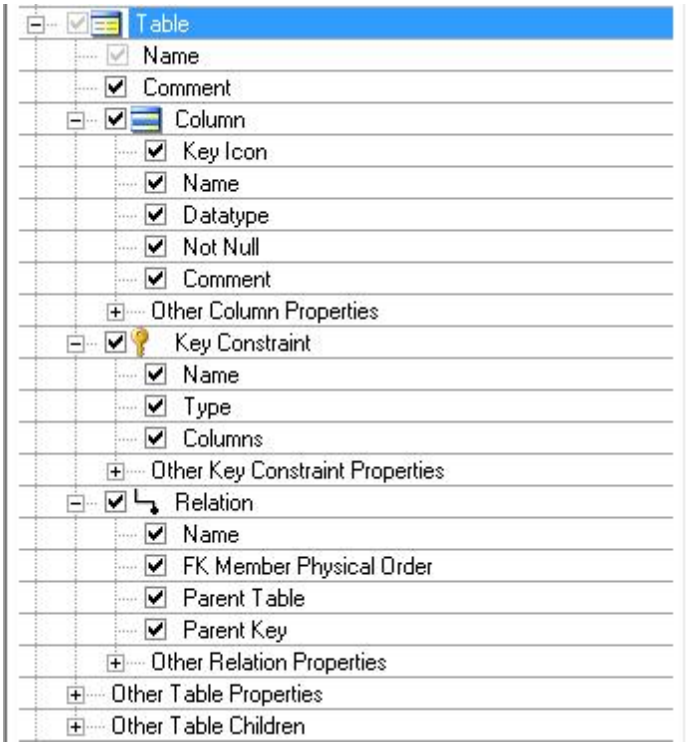

Table with Columns (using checkboxes for Not Null), Key Contraints and properties (no header), and Relations and properties

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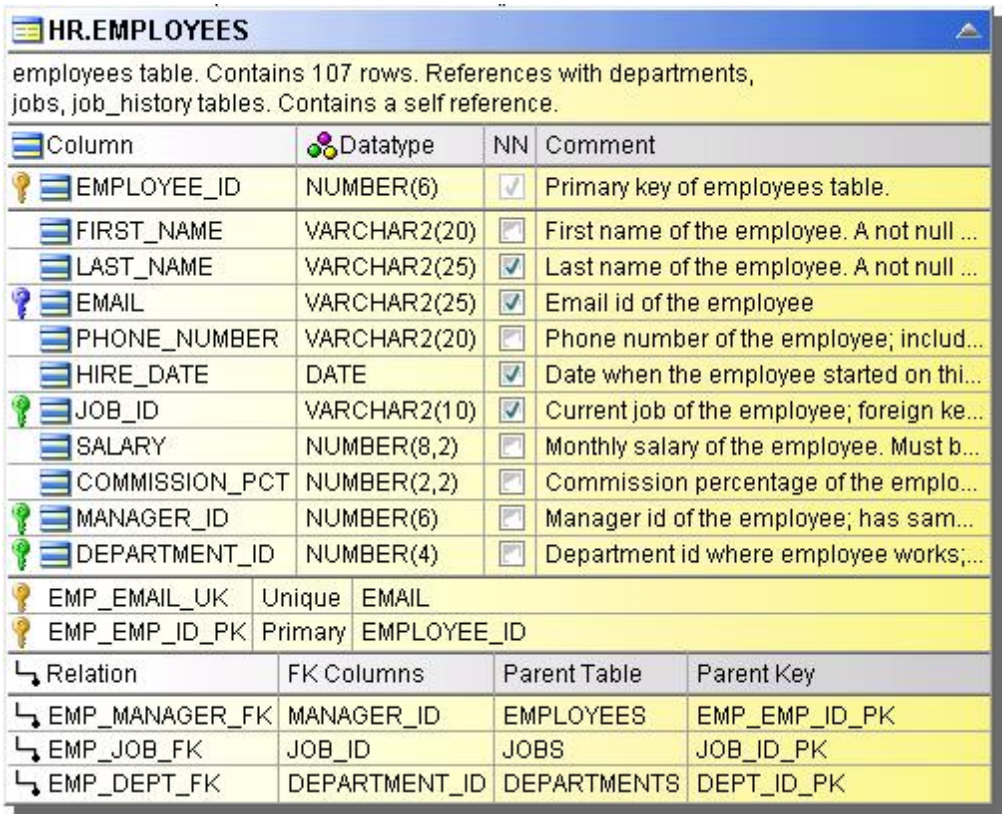

HR.EMPLOYEES

employees table. Contains 107 rows. References with departments, jobs, job_history tables. Contains a self reference.

Column	Datatype	NN	Comment
EMPLOYEE_ID	NUMBER(6)	☑	Primary key of employees table.
FIRST_NAME	VARCHAR2(20)	☐	First name of the employee. A not null ...
LAST_NAME	VARCHAR2(25)	☑	Last name of the employee. A not null ...
EMAIL	VARCHAR2(25)	☑	Email id of the employee
PHONE_NUMBER	VARCHAR2(20)	☐	Phone number of the employee; includ...
HIRE_DATE	DATE	☑	Date when the employee started on thi...
JOB_ID	VARCHAR2(10)	☑	Current job of the employee; foreign ke...
SALARY	NUMBER(8,2)	☐	Monthly salary of the employee. Must b...
COMMISSION_PCT	NUMBER(2,2)	☐	Commission percentage of the emplo...
MANAGER_ID	NUMBER(6)	☐	Manager id of the employee; has sam...
DEPARTMENT_ID	NUMBER(4)	☐	Department id where employee works;...

EMP_EMAIL_UK	Unique	EMAIL
EMP_EMP_ID_PK	Primary	EMPLOYEE_ID

Relation	FK Columns	Parent Table	Parent Key
EMP_MANAGER_FK	MANAGER_ID	EMPLOYEES	EMP_EMP_ID_PK
EMP_JOB_FK	JOB_ID	JOBS	JOB_ID_PK
EMP_DEPT_FK	DEPARTMENT_ID	DEPARTMENTS	DEPT_ID_PK

...and the resulting display

Notable Display Options

Table.Column.Index Designators

- ***P - Primary Key Index***
- ***U**n* **- Unique Key Index** *(where n is the generation order)*
- ***F**n* **- Foreign Key Index**
- ***C - Clustered Index***
- ***Q**n* **- Unique Index**
- ***I**n* **- Non-Unique Index**

Index Designator and Key Designator

- ***same codes as above***

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3.4.2 Model Subsets

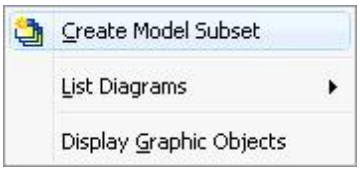
Model Subsets provide a basic organizational framework for your Model. They let you break your model into more manageable pieces of related tables and views - in whichever way you want. Its similar to a music playlist. And like a music playlist, sometimes you want to automatically add items based on some criteria. ModelRight 4.0 adds this capability. In previous versions, you could manually select the individual objects that you want in the subset. In ModelRight 4.0, you can either manually specify the subset objects or you can specify some criteria that is used to add and remove objects automatically. The criteria can be defined in terms of some property having some value - or no value, or an inherited value, etc... You can have multiple criteria that are combined to give you the result set that you want.

A Model Subset defines a subset of Model objects. A Model can own any number of Model Subsets and a Model Subset can own any number of Diagrams. i.e. the Model Subset defines the Model objects (i.e. Tables and Views) that will be in the Diagram and the Diagram defines how those objects are displayed. This allows you to organize and view a given set of Tables and Views in many different ways. Relations are automatically included in the Diagram if both the parent and child Tables/Views are in the Model Subset.

New in ModelRight 4.0

Like a music playlist, you may sometimes want to have items automatically added based on some criteria. ModelRight 4.0 provides this capability for Model Subsets. You can specify a filtering condition and ModelRight 4.0 will automatically add and remove objects based on that condition - saving you the trouble of having to manually add and remove them. ModelRight 4.0 provides a Model Subset Wizard to help you create and edit Model Subsets:

Simply right click on the background of the Diagrams portion of the Model Explorer to get the context menu:



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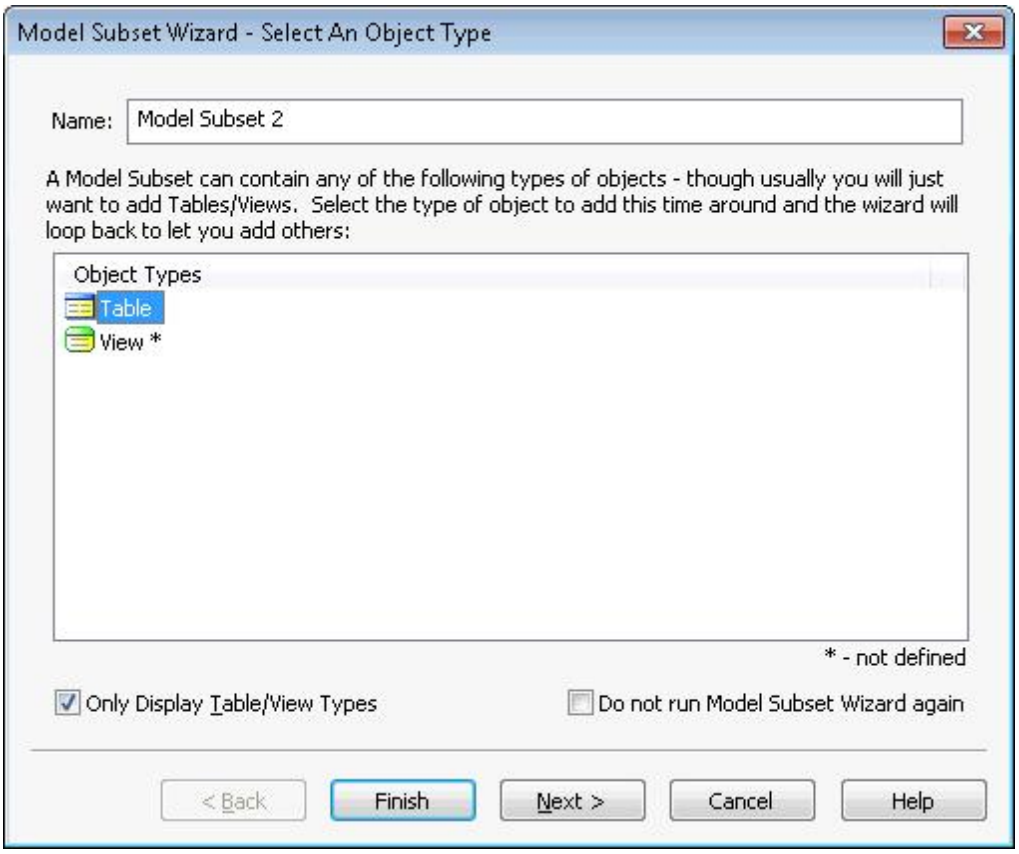
Model Subset Wizard - Select An Object Type
Name:
Model Subset 2
A Model Subset can contain any of the following types of objects - though usually you will just want to add Tables/Views. Select the type of object to add this time around and the wizard will loop back to let you add others:
Object Types
Table
View *
* - not defined
Only Display Table/View Types
Do not run Model Subset Wizard again
< Back
Finish
Next >
Cancel
Help

First step is to select the type of object that you want to include in your Diagrams. Uncheck the "Only Display Tables option if you want to include other types of objects besides Tables and Views.

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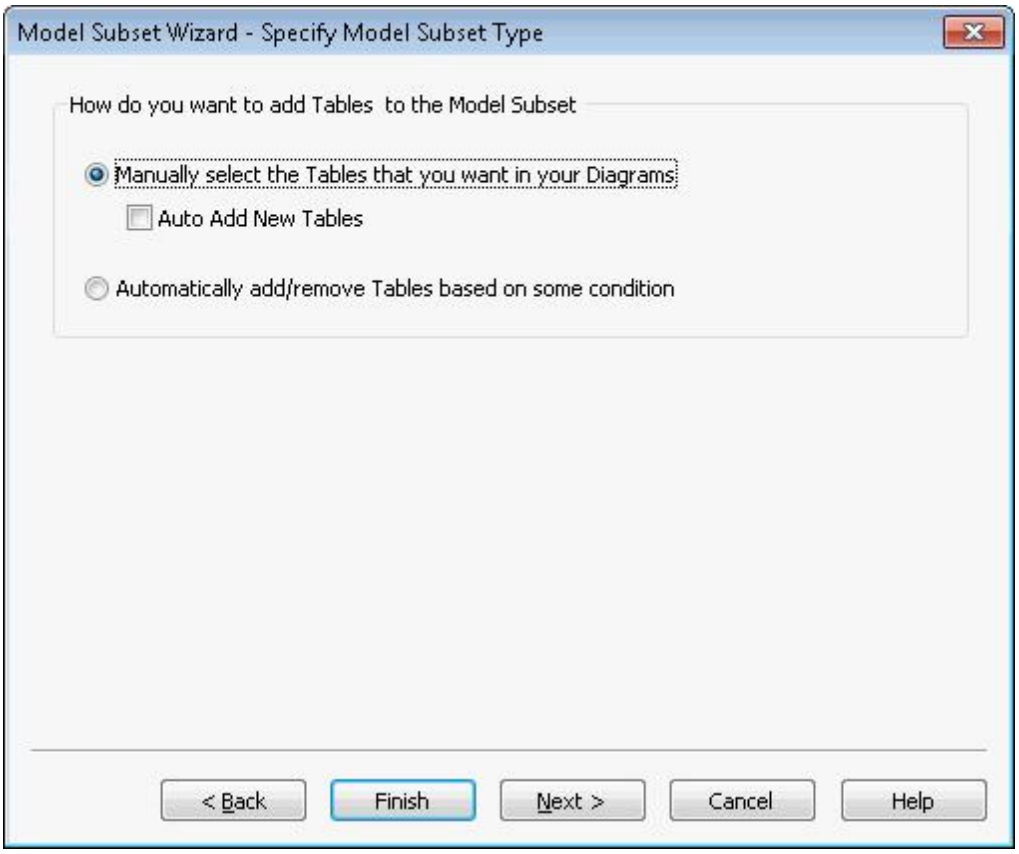
Model Subset Wizard - Specify Model Subset Type
How do you want to add Tables to the Model Subset
Manually select the Tables that you want in your Diagrams
Auto Add New Tables
Automatically add/remove Tables based on some condition
< Back
Finish
Next >
Cancel
Help

Then specify how you want to add/remove objects of that type. Select Manual if you want to manually select them or Automatically if you want to specify a condition that determines their membership.

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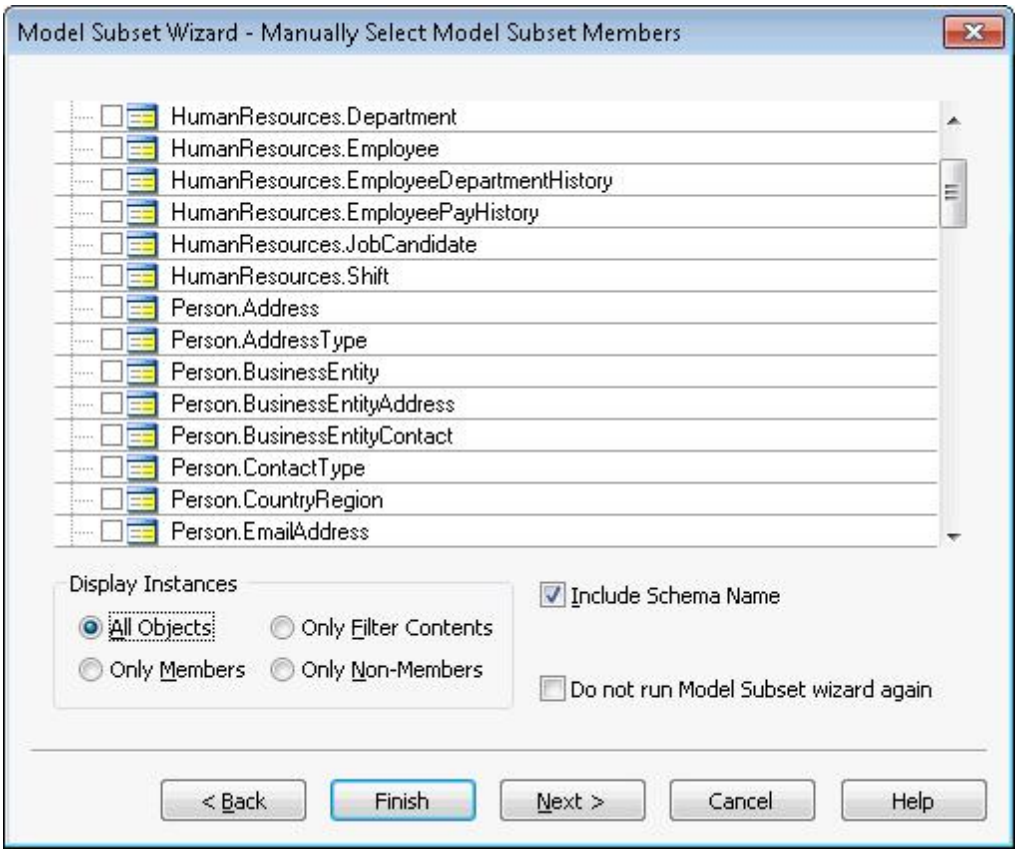

The Manual option. Just check the ones you want in your Model Subset's Diagram(s). The controls below the list let you control what is displayed in the selection list.

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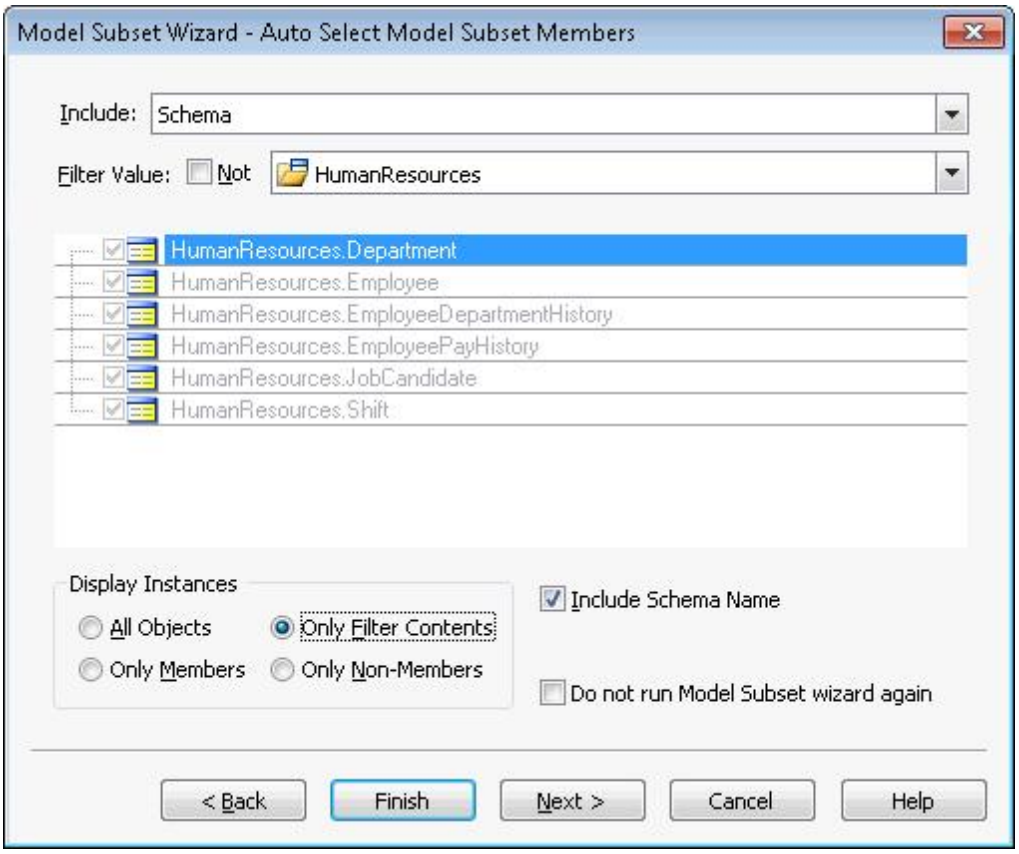

With the Automatic option, you can specify a Filter condition. In this example, we specified that we only want to display Tables that are in the HumanResources schema.

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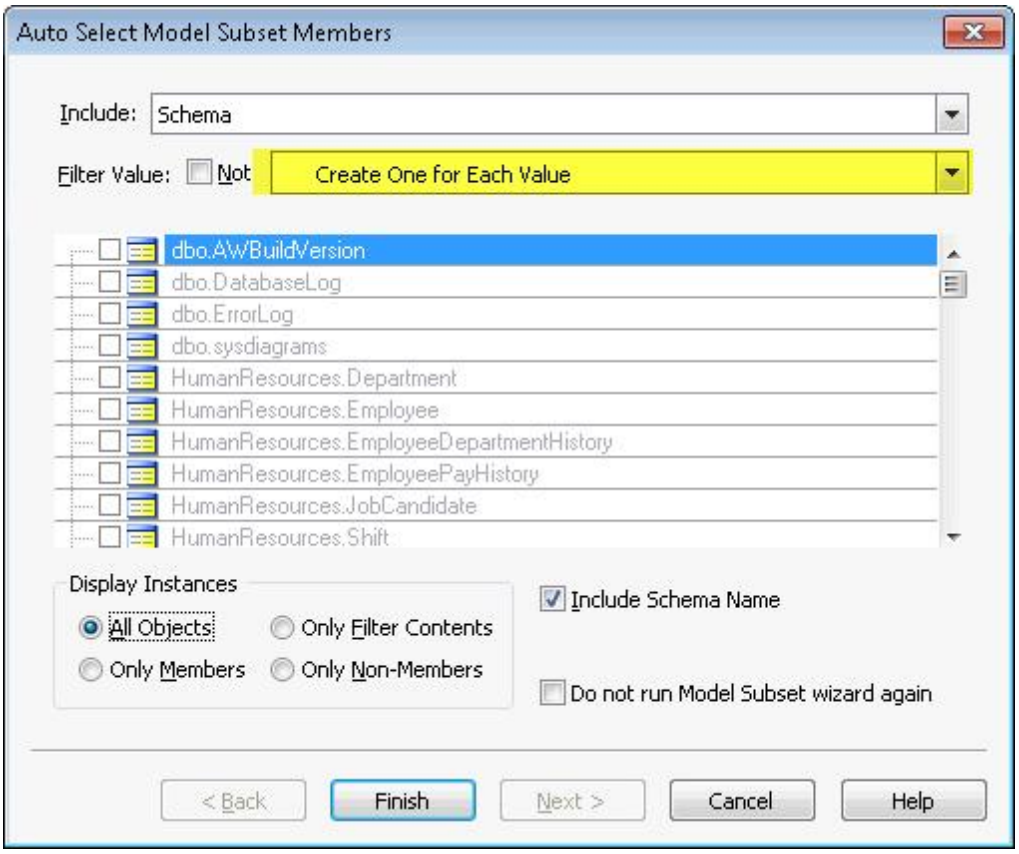

or you can select the special value "Create One for Each Value" to have ModelRight create a Model Subset for each Schema.

You can also edit a Model Subset like any other object - select it and then change its properties in the Property Browser. When you select a Model Subset, the following page will be displayed in the Property Browser to let you edit the Model Subset:.

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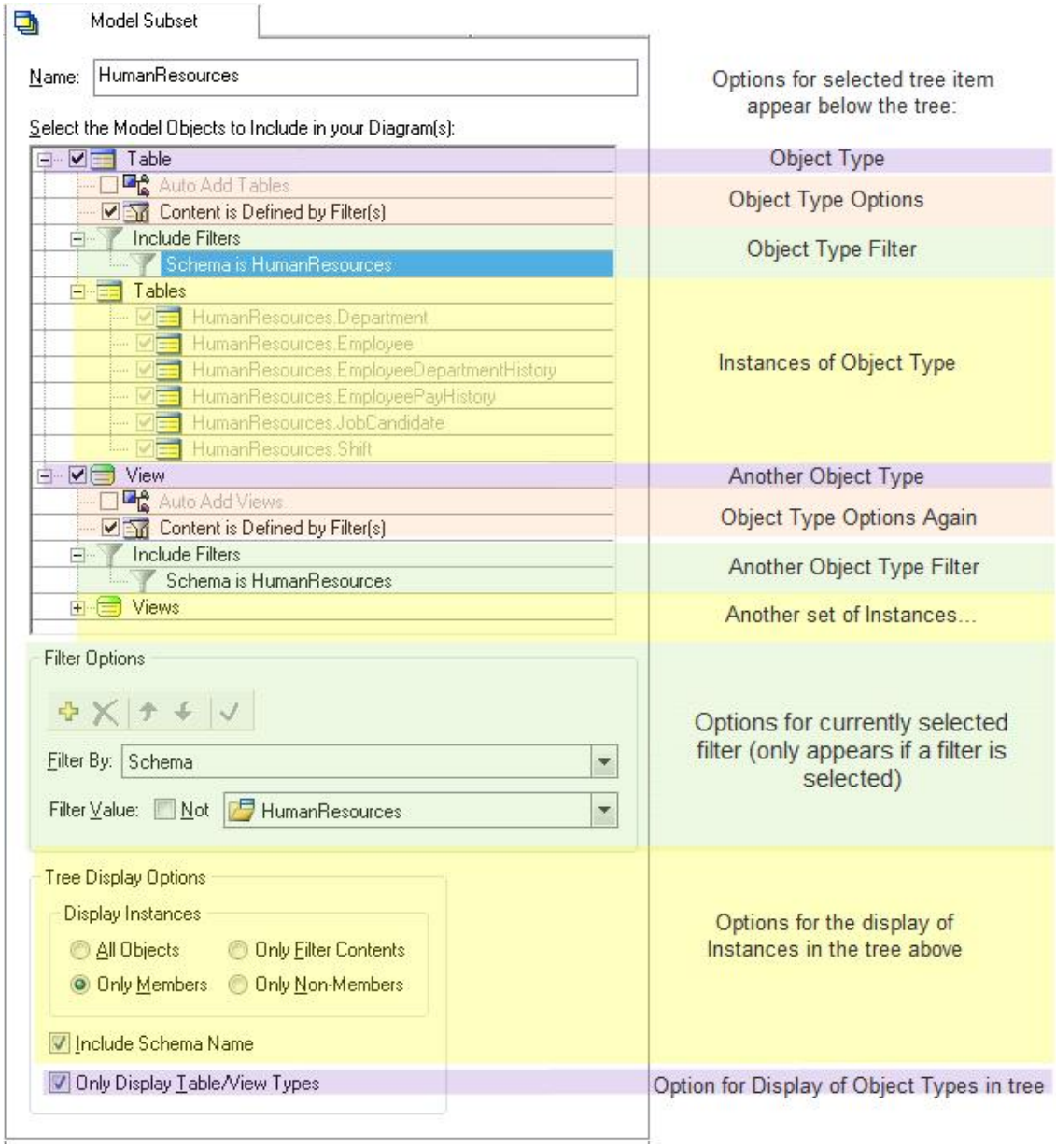

If the "Content is Defined By Filter" option is not selected, then the Filter can still be used in conjunction with the Only Filter Contents option to display only instances that satisfy the filtering condition.

Auto Attach New Tables - allows you to indicate that you would like any newly created Tables/Views to be automatically added to this Model Subset.

Include Child Tables - if this option is selected when you add a table(s), then along with the selected table(s), ModelRight 4.0 will add any tables that references the selected table(s). Since the added table(s) will be selected after the add, you can continue to hit the add button to add additional levels of related child tables.

Include Parent Tables - if this option is selected when you add a table(s), then along with the selected table(s), ModelRight 4.0 will add any tables that the selected table(s) references.

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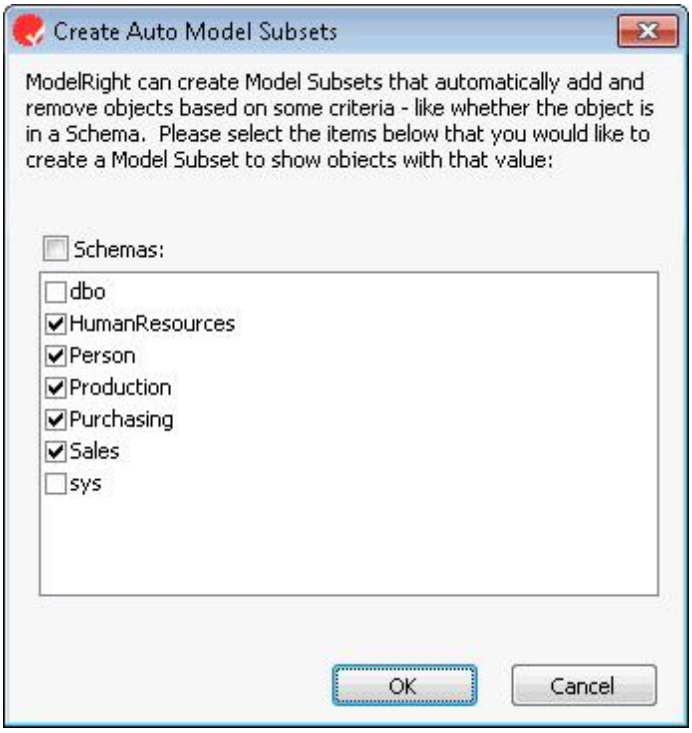
Since the added table(s) will be selected after the add, you can continue to hit the add button to add additional levels of related parent tables.

After Reverse Engineering from the database, ModelRight 4.0 gives you the option to create a Model Subset for any of your Schema or Storage objects.


Create Auto Model Subsets
ModelRight can create Model Subsets that automatically add and remove objects based on some criteria - like whether the object is in a Schema. Please select the items below that you would like to create a Model Subset to show objects with that value:
Schemas:
dbo
HumanResources
Person
Production
Purchasing
Sales
sys
OK
Cancel

3.4.3 Relation Display Options

Relation display options that are applied to all Relations in a Diagram are surfaced as Diagram options. Relation display options that can vary on a per-Relation basis are surfaced as Relation Graphics options. For example, the Line Style option (Diagonal vs Orthogonal) is a Diagram Display option, since you would most likely want to have all Relations in a Diagram drawn one way or the other. Whereas the Line Color option is a Relation Graphic option, since you may want to give different Relations different colors.

You can view the Diagram Display options by selecting a Diagram in the Model Explorer and then selecting the Display tab in the Property Browser and then selecting Relation in the Display Type control. Or you can right click on the background of a Diagram and select **Display Relation->Properties** from the context menu. Since a Diagram can inherit its properties from a Diagram Template, you can use the <default> Diagram Template to change display options for all Diagrams (that inherit from the <default> Template and haven't overridden the property - see Templates).

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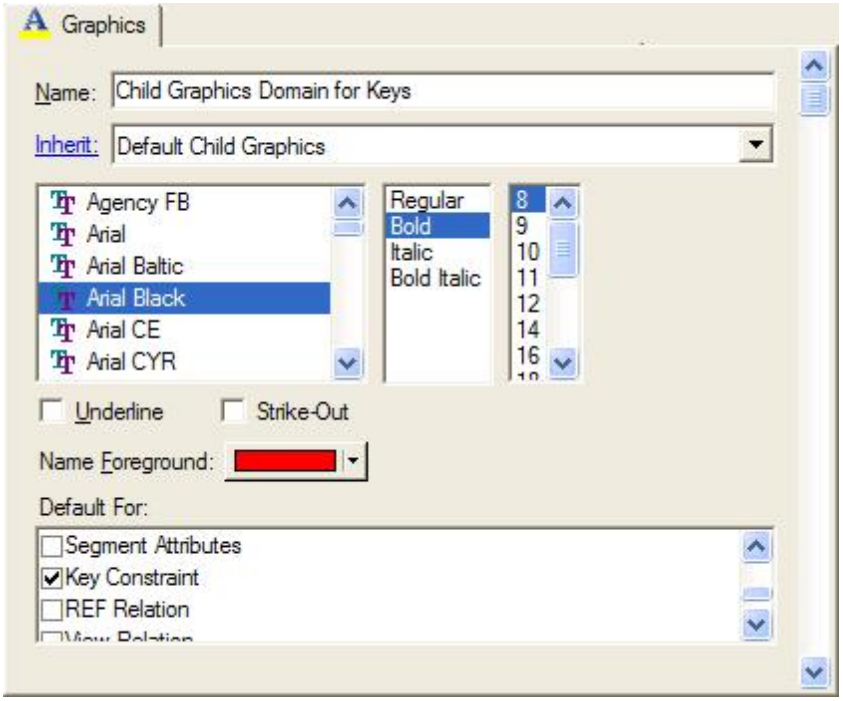
You can view the Relation Graphics options by selecting a Relation in the Diagram and then selecting the Graphics tab in the Property Browser. Since a Relation Graphic object inherits from Relation Graphics Template, you can edit the Default Relation Graphics Object to affect the display of all Relations in all Diagrams (if the property hasn't been overridden).

3.4.4 Child Graphics

A Child Graphic refers to the Graphic object that is used to hold display information for non-Column children of a Table that are displayed inside a Table in a Diagram. See Diagram Display Options for more details. For example, you could choose to display Key Constraints inside a Diagram Table. If you do so, a Child Graphic object will be created for each displayed key. Each of these Child Graphic Objects will inherit from a Child Graphics Template. Which Child Graphics Template it will initially inherit from depends on the type of object it is. You can specify that a Child Graphics Template is the default for different object types in the Child Graphics Template property tab:



This screenshot shows that I have a Child Graphics Template called "Child Graphics Template for Keys" and made it the default for Key Constraints. Now if I chose to display Key Constraints inside a Diagram Table, they will automatically be set to inherit from this Template, and hence be displayed red and bold.

3.4.5 Themes

Themes allow you to quickly and easily change the look of a Diagram. Maybe you would like to use one set of colors to print your Diagram and another to view it. Themes let you do that and much more in a single click. Any of the visual characteristics of the Diagram can be changed by the Theme. Themes do not effect the content of the Model, just its display.

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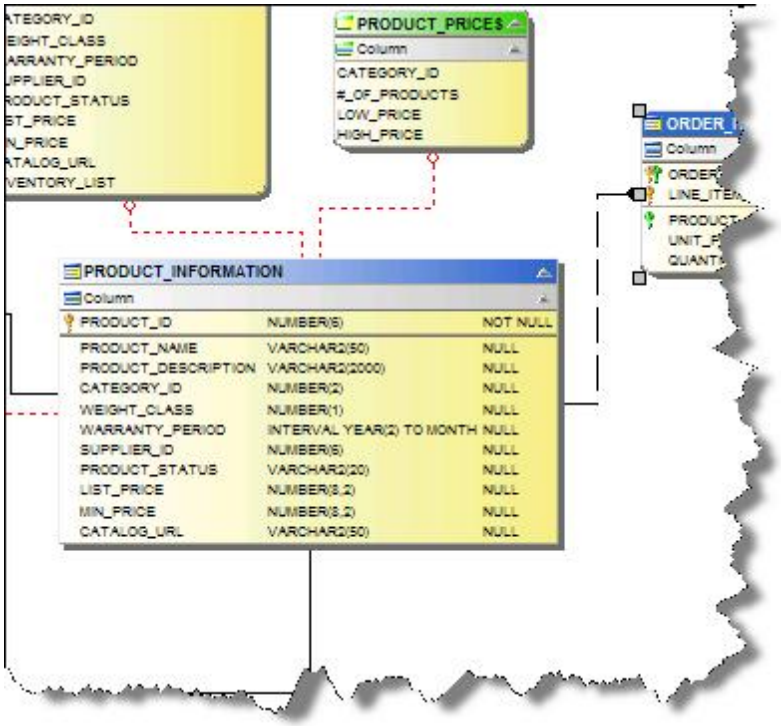
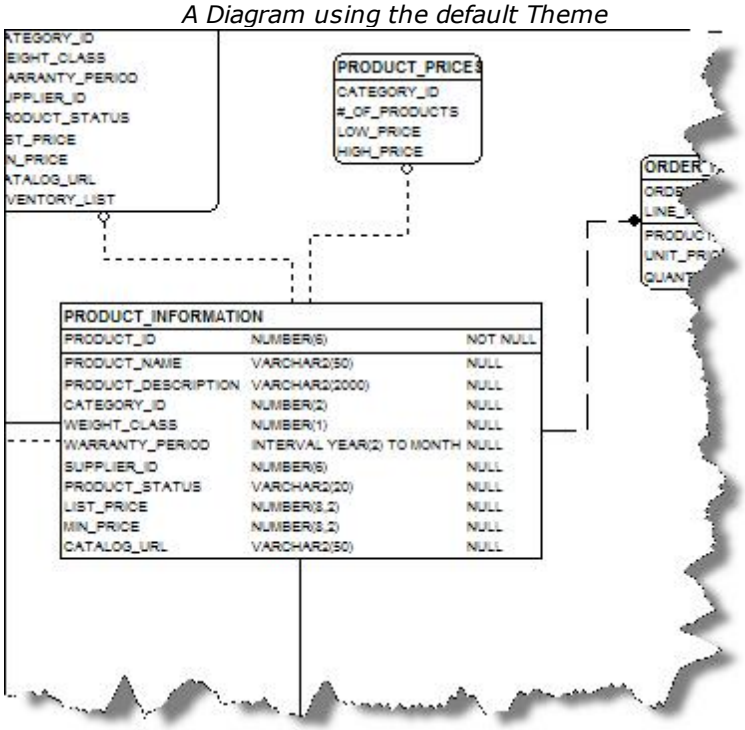


A Diagram using the default Theme



A Diagram using the Printer Friendly Theme

Just select a Diagram object and set its Theme on the Diagram Property Page.

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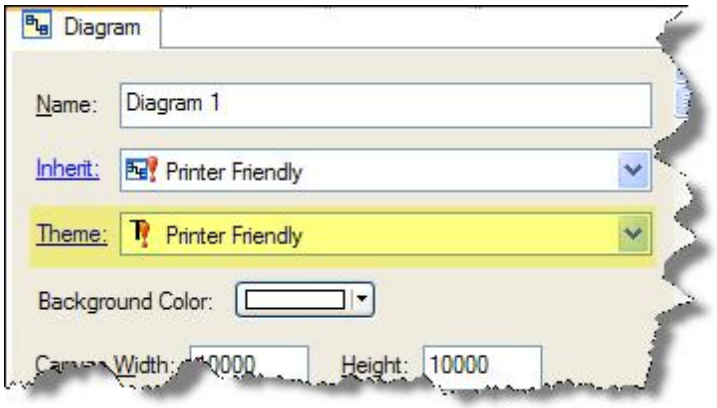
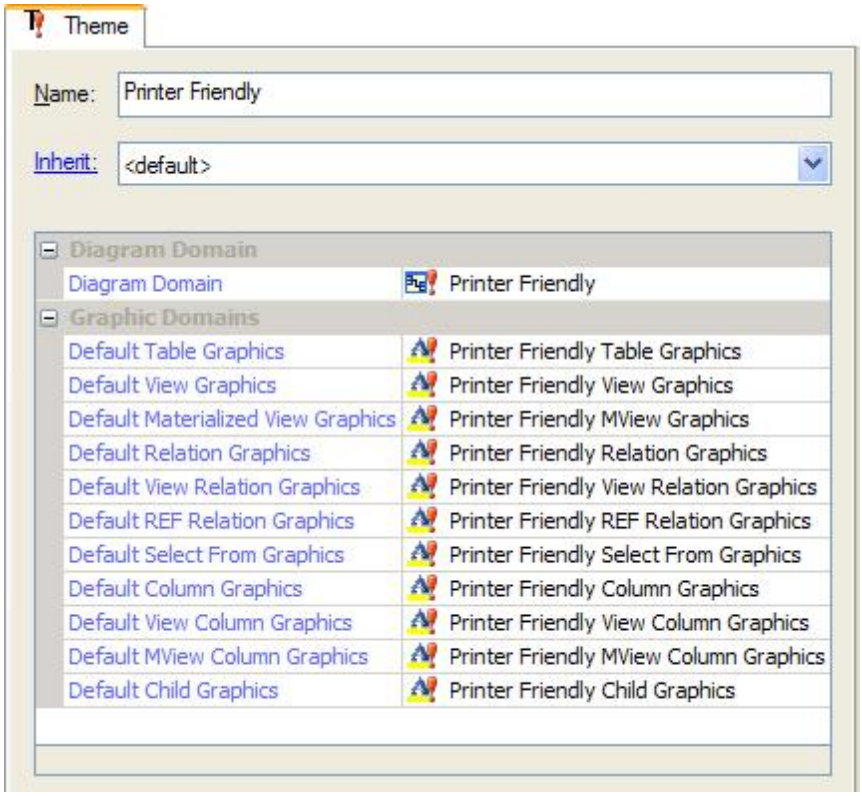


To change a Diagram's Theme, simply select the Diagram and then select the new Theme.

A Theme is simply a collection of Templates that should be applied to a Diagram's displayed objects. i.e. when a Theme is applied to a Diagram, it will change the Templates that the Graphic Objects and the Diagram inherit their properties from. It sounds complicated, but its very easy to use.



The Theme Property Page

By default, a Diagram only has a Default Theme and a Printer Friendly Theme, but you can easily add others or copy/paste them from another Model. Keep an eye on the ModelRight Downloads page for sample Models with Themes that have been contributed by other users.

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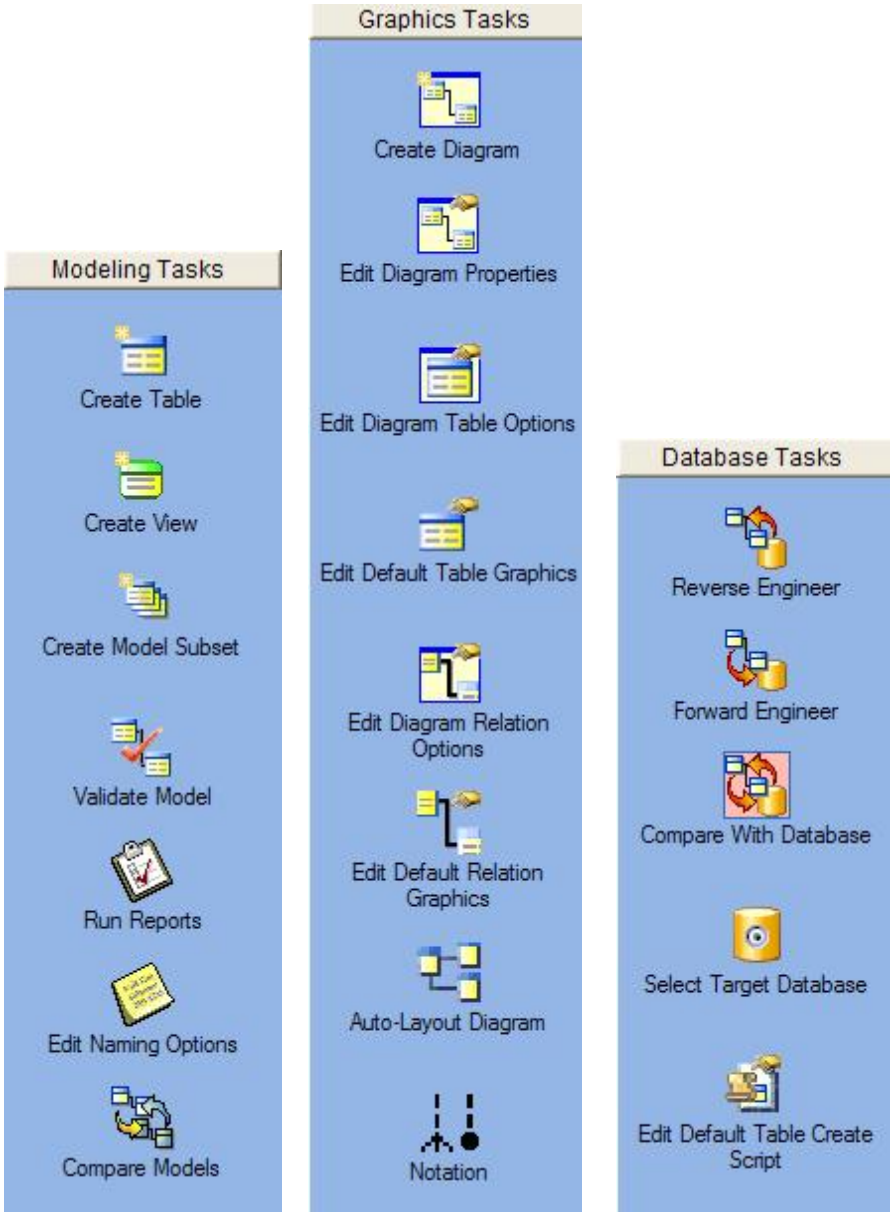
Themes are not to be confused with Windows Skins and Styles under the Window menu. Windows Skins and Styles effect how the Windows frames, borders and titles are drawn, but not how objects inside a Diagram are drawn.

3.5 Shortcuts toolbar

The Shortcut Taskbar provides quick access to common or highlighted tasks. Select the section headers at the bottom of the toolbar to display the different sections. Click through the various icons to get acquainted with the product and its capabilities.



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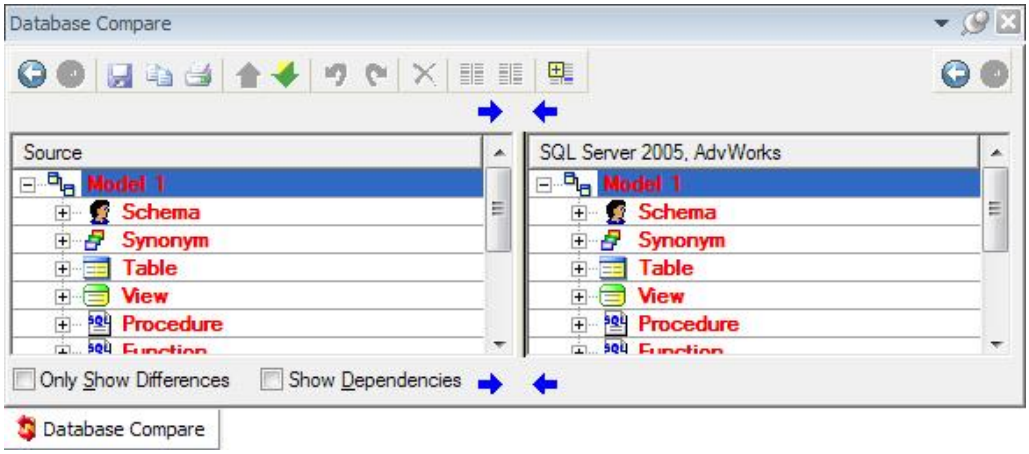
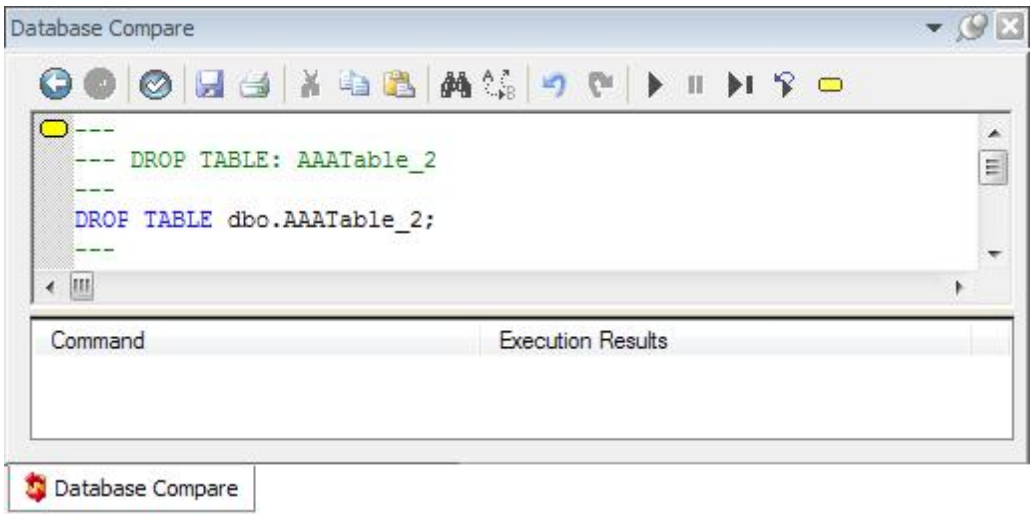
3.6 Modeless Database Compare

The Database Compare Window allows you to see the differences between your Model and the Database at all times. It contains the same pages as the Database Compare Wizard but is "modeless". i.e. you can work on your Model while its displayed.



If you want to export a difference to the database, select the compare item and click on the solid blue arrow that points to the right. To make the corresponding change in the database, click on the navigate forward button at the top of the page til you get to the Generate Script page. This page allows you to execute or "Save to File" the database commands that will effect your changes in the database.



To create these commands, ModelRight 4.0 keeps an internal list of the changes that you have made. Once you have executed or saved these commands, you should select the "Commit and Return" toolbar button , to return to the Compare page and to indicate to ModelRight 4.0 that it can reset this internal list of changes - so it won't continue to create these same commands.

As with any other ModelRight 4.0 window, you can dock or undock this window (by dragging

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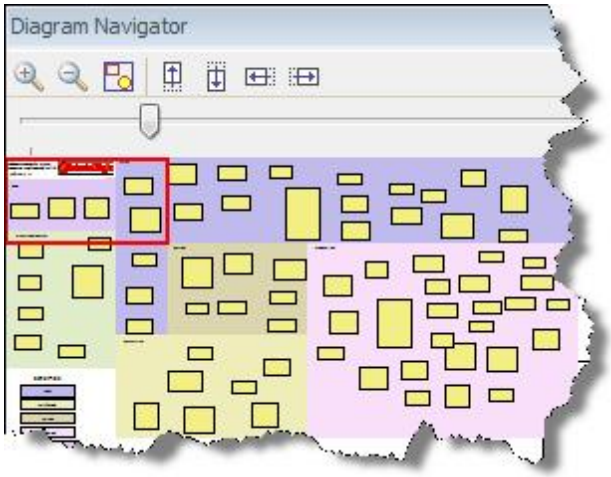
the tab). You can Auto-Hide it (by selecting the pushpin on the window's border). Or you can change the order in which its listed (by dragging the tab to another tab position).

3.7 Diagram Navigator

The Diagram Navigator window displays a zoomed out view of the currently active Diagram. The red rectangle represents the portion of the Diagram that is currently being viewed. You can select and drag the rectangle to pan around the Diagram. To zoom you Diagram, you can move the zoom slider thats under the toolbar or resize the red rectangle. Also, you can just click on the Diagram Navigator window to instantly center your view around the clicked location.



The Diagram Navigator Toolbar

- Zoom In on the Diagram Navigator

- Zoom out on the Diagram Navigator

- Zoom the Diagram Navigator to fit the contents of the Diagram

- Nudge the display of the Diagram up, down, left or right

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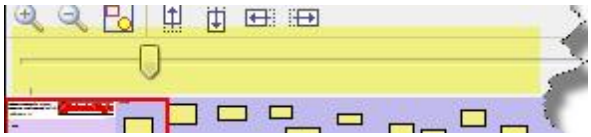
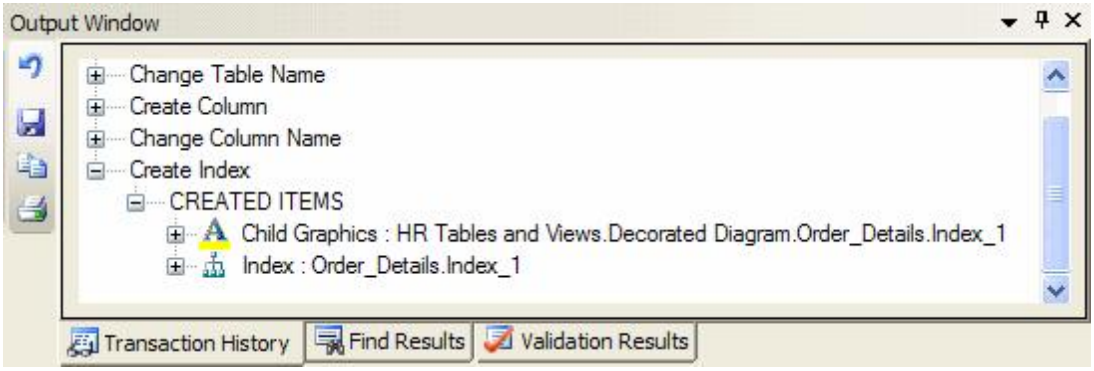
The Diagram Navigator Zoom Slider



The Zoom slider at the top of the Diagram Navigator window can be used to quickly and easily zoom the Diagram.

3.8 Transaction History

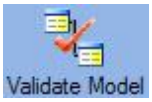
Whenever you make a change, ModelRight uses an internal "transaction" to contain the full impact of your change. When the transaction completes, it evaluates all of these changes and inserts an entry to this tab. Any entry can be expanded so that to see the full impact of your changes.



You can specify the number of transactions to view in the dialog in the **Tools->Options** dialog.

If you right click on any of the transactions, a context menu will be displayed. If you select the Undo option, ModelRight will roll-back all the transactions up to and including the one you selected.

3.9 Model Validation

Selecting the menu item **Model -> Validate**, or the Shortcut Task 

brings up the Model Validation dialog. This dialog allows you to check your model for commonly occurring problems and issues. Entries marked with a red dot ● indicate an issue that will prevent the model from generating to the database. Entries marked with a yellow dot ● indicate a possible issue, but not something that would prevent your model from generating to the database.

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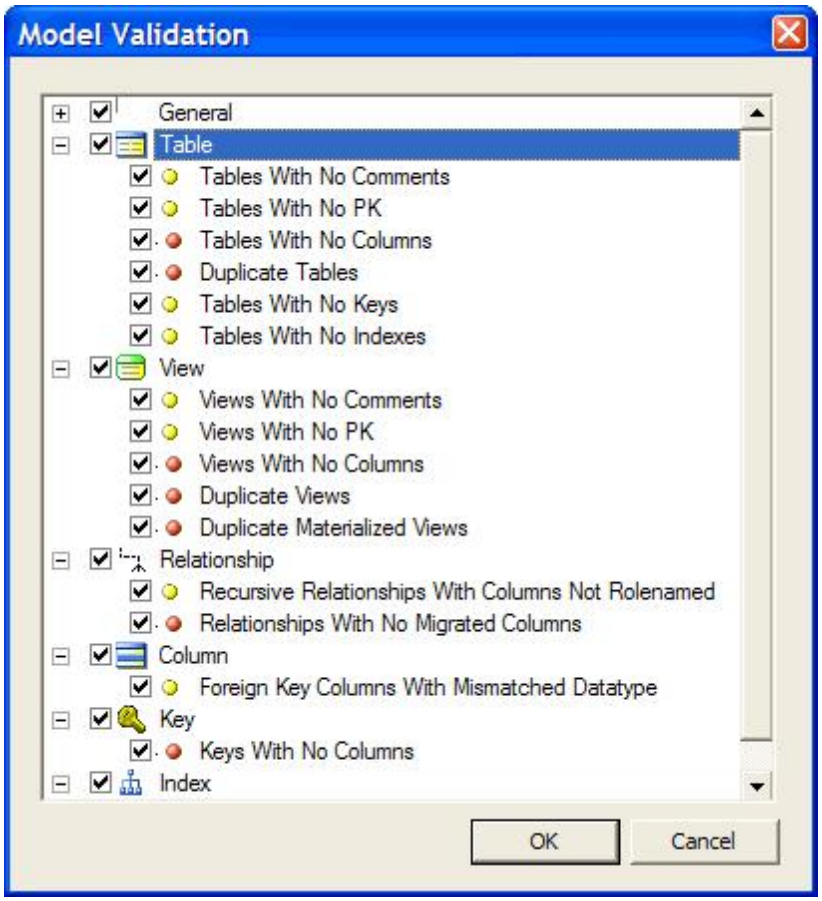
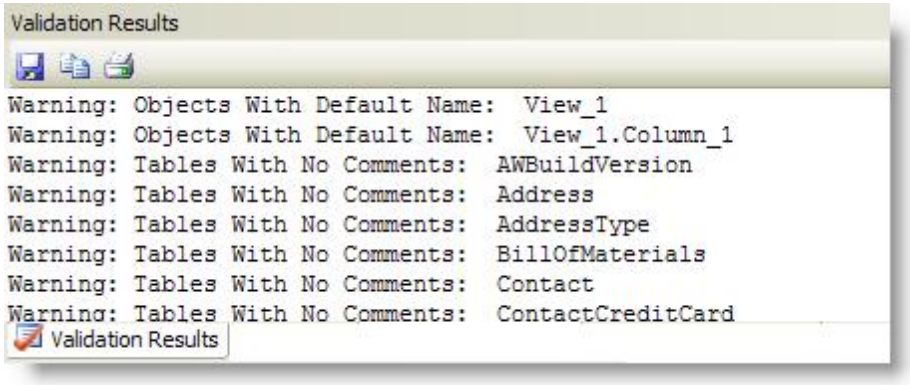


The results of running a Model Validation are displayed in the Validation Results window. When you select an item in this window, the corresponding object is selected. The Validation Results window allows extended selections so you can select multiple items and make changes to them all at once (using the Property Browser).


Validation Results
Warning: Objects With Default Name: View_1
Warning: Objects With Default Name: View_1.Column_1
Warning: Tables With No Comments: AWBuildVersion
Warning: Tables With No Comments: Address
Warning: Tables With No Comments: AddressType
Warning: Tables With No Comments: BillOfMaterials
Warning: Tables With No Comments: Contact
Warning: Tables With No Comments: ContactCreditCard
Validation Results

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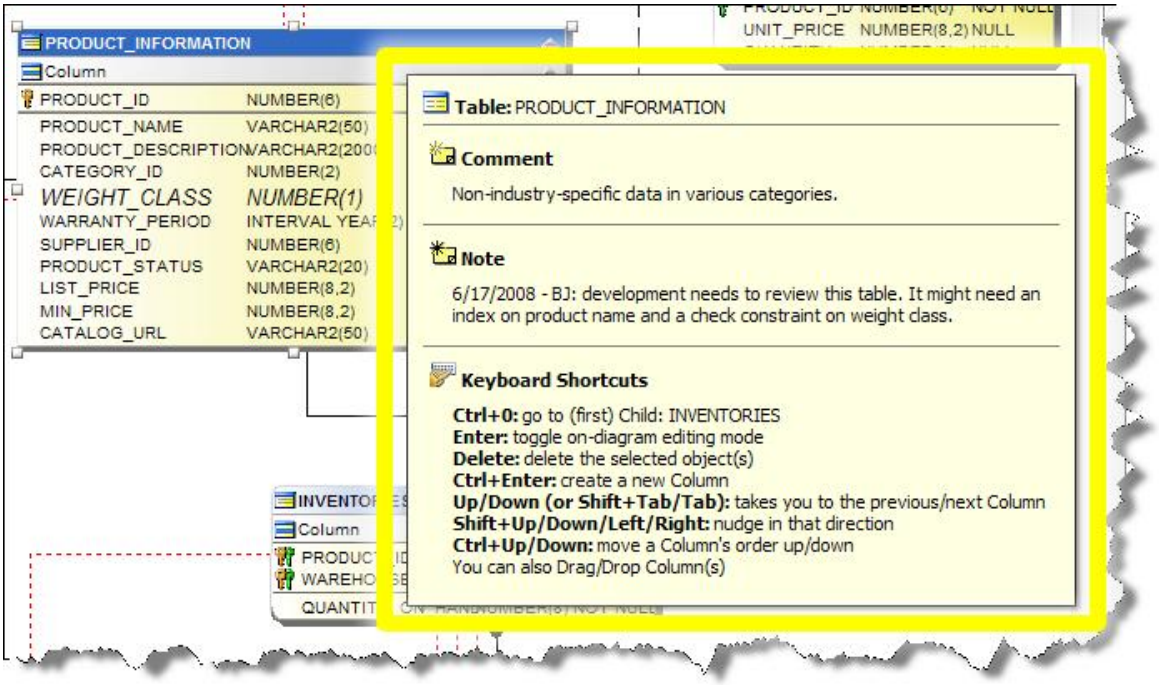
3.10 Diagram Tooltips

ModelRight 4.0 has the ability to show informational tips about objects when your mouse hovers over them in the Diagram:



An example of a ModelRight tooltip that is displayed when the mouse cursor is hovering over a Table

You can control what information is displayed in the Tools/Options/Tooltips dialog:

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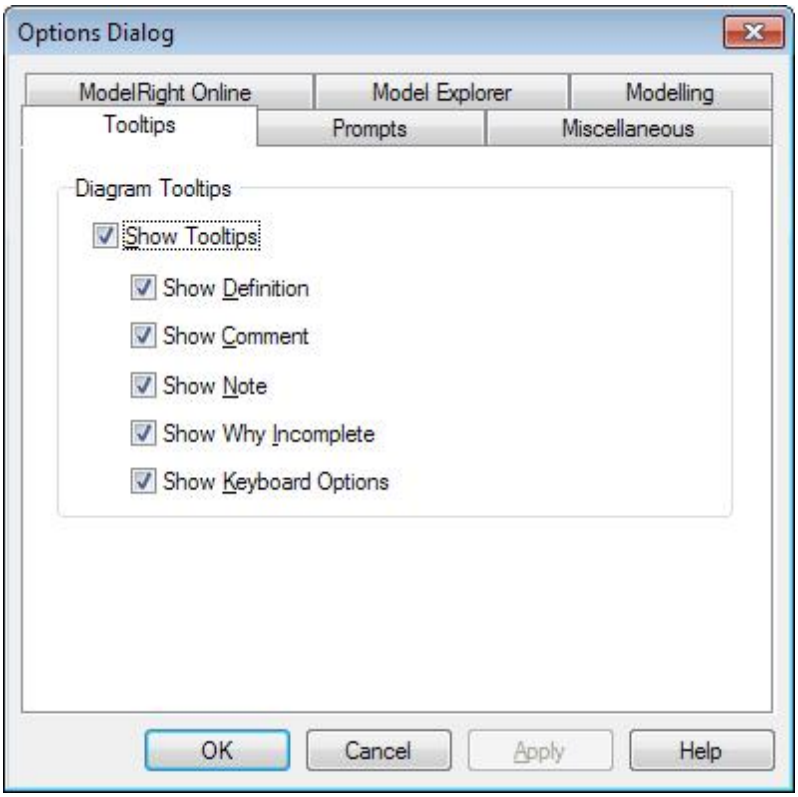
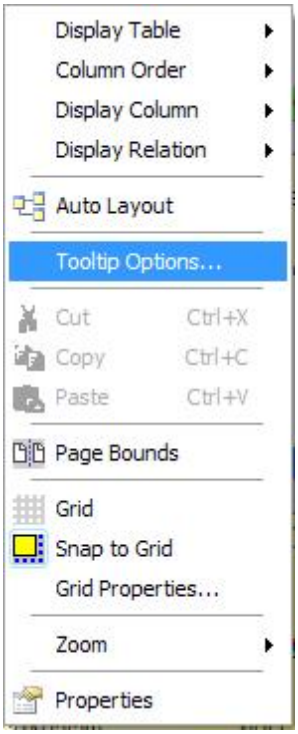


You can display this dialog by either selecting the Tool/Options menu item and then selecting the Tooltips tab or by right clicking on the Diagram's background and selecting the Tooltip Options menu item:



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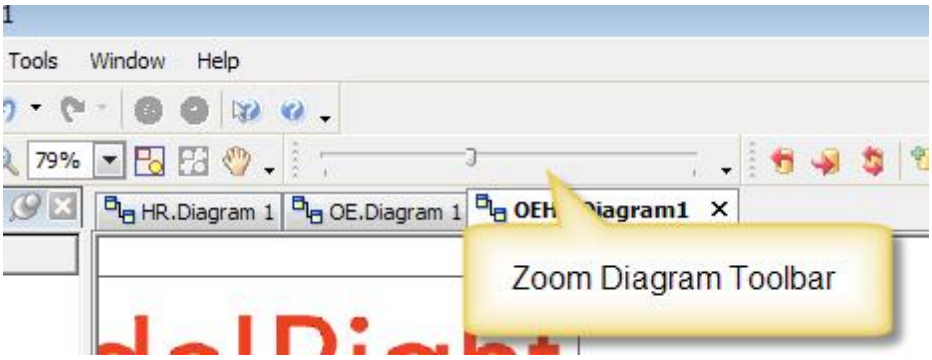
The Tooltip options are application-wide - meaning they are set for the application and will be the same regardless of the Model or Diagram in use.

3.11 Diagram_Zoom

Slider controls have been added to the main toolbar and the Diagram Navigator window to let you quickly and easily zoom your Diagram. Just like any other toolbar, you can drag the Zoom Diagram slider that's on the main toolbar to anywhere on the main toolbar - or elsewhere.



3.12 Keyboard Shortcuts

You can use the following keyboard shortcuts in ModelRight 4.0:

Key	Action
F1	Help
F3	Toggle Model Explorer Display
F4	Toggle Property Browser Display
Alt+Enter	Toggle Property Browser Display
Del	Delete Selected Objects
Ctrl+A	Select All
Ctrl+C	Copy Selected Objects to Clipboard
Ctrl+F	Toggle Full Screen Display
Ctrl+G	Go To in Diagram
Ctrl+Shift+L	Toggle Reverse Engineer Logging
Ctrl+N	New Model
Ctrl+O	Open File
Ctrl+P	Print

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Ctrl+S	Save to File
Ctrl+T	Go To Selection in Diagram
Ctrl+X	Delete Selected Objects
Ctrl+V	Paste Clipboard Contents
Ctrl+Y	Redo
Ctrl+Z	Undo
Alt+Back	Undo
Ctrl+1, 2...5	Go To User-Defined Link
Ctrl+9	Go To Parent
Ctrl+0	Go To Child
Ctrl+Right Arrow	Select Next
Alt+Right	Select Next
Ctrl+Left	Select Previous
Alt+Left	Select Previous
Shift+Up, Down, Left, Right	Nudge Up, Down, Left, Right

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Part

4 Concepts

This section describes basic concepts that are central to the operation of ModelRight.

4.1 Basics

Objects

In ModelRight everything is either an object or a property. Things like Tables, Columns, Models, Templates, etc... are all examples of objects. Objects can own other "child" objects. For example, a Table can own Columns. The Model Explorer shows the objects in the Model. The Model Browser provides an unfiltered, read-only view of a Model's objects and properties.

Model

A Model is the root object. It owns either directly or indirectly all other objects. For example, a Model owns Table objects directly and Column object indirectly (since they are owned by Table objects).

Properties

Objects hold values for properties. Examples of properties are Name, Comment, Datatype, etc... An object's properties are displayed in the Property Browser when the object is selected (in either the Model Explorer or the Diagram). When you click a checkbox or change text in an edit control on the Property Browser, you are creating or changing the value of a "local" property - a property that is defined on the object itself. You can delete a local property using the Reset tab of the Property Browser. Properties can also be "inherited" from a Template. ModelRight also supports "calculated" properties. Calculated properties are not local or inherited, but are determined dynamically - usually based on the value of other properties. Therefore as those other properties change the calculated property automatically changes based on the new values. The Name of Graphics objects is an example of a calculated property - the Name is based on the name of the object that the Graphic object represents.

Meta Model

The Meta Model provides a map of how different types of objects and properties are connected. For example. it describes what properties an object can have and what type of child objects it can own. If you use ModelRight's scripting capabilities, you need to know this information so that you can programmatically navigate an object's children and properties. ModelRight provides a Meta Model Browser that displays the entire ModelRight meta-model in tree format.

Diagrams

A Diagram is an object that is used to display a set of Table, Views, Relations, etc... Which Tables and Views are displayed is defined by the Model Subset that owns the Diagram. A Graphics Object is created (and owned by the Diagram) for each Table, View, Column, etc. that is displayed in the Diagram to represent the object and store graphical properties. A Model can any number of Model Subsets and a Model Subset can own any number of Diagrams. When you Open a Diagram a window is created to graphically display the contents of the Diagram. Opening and Closing a Diagram has no affect on the underlying

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Model.

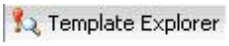
Files

In ModelRight, a file contains one and only one Model. When you save a file, the Model is saved in a file with a .WER extension. The "workspace" is saved in a file with the same name, but with a ".WWS" extension. The workspace contains information about what Diagrams are open and other user interface information.

4.2 Templates

A Template (formerly called Domain) is simply an object that can be reused to define other objects. It defines the properties and objects that other objects can "inherit" - in effect allowing you to organize any type of object into classes with share properties. If an object doesn't have value for a property, ModelRight will look to see if the it's Template has a value for the property. You can think of Templates as a way to classify your objects based on the properties they have in common and then define those properties in one place - the Template. For example, you might have lots of Columns in your Model that are some type of ID (Customer ID, Employee ID, etc...). Instead of having to assign common properties to them individually (a datatype of INTEGER, NOT NULL, etc..), you could create a Template named ID, assign to it the common properties and then assign it to all of your ID Columns. That way you are assured consistency of those properties across all of your ID Columns and you can easily change their properties simply by changing the ID Template. So Templates effectively provide a way to classify your objects, organize their properties, enforce consistency of property values, and easily make changes across the class of objects. Of couse, you can add arbitrary level of Templates to suit your desired meta-data organization.e

ModelRight always provides a "default" Template for any object that uses Templates. Thus give you a way to set Model-wide defaults for any property - JUST by setting it on the default Template.

To see all the different types of Templates that ModelRight supports, click the 

tab at the bottom of the Model Explorer. A red exclamation point is used throughout ModelRight 4.0 as a symbol for a Template. We provided a Template for any type of object for which we thought it would be helpful (Table Templates for Tables, Column Templates for Columns, etc...), but let us know if we you would like any others!

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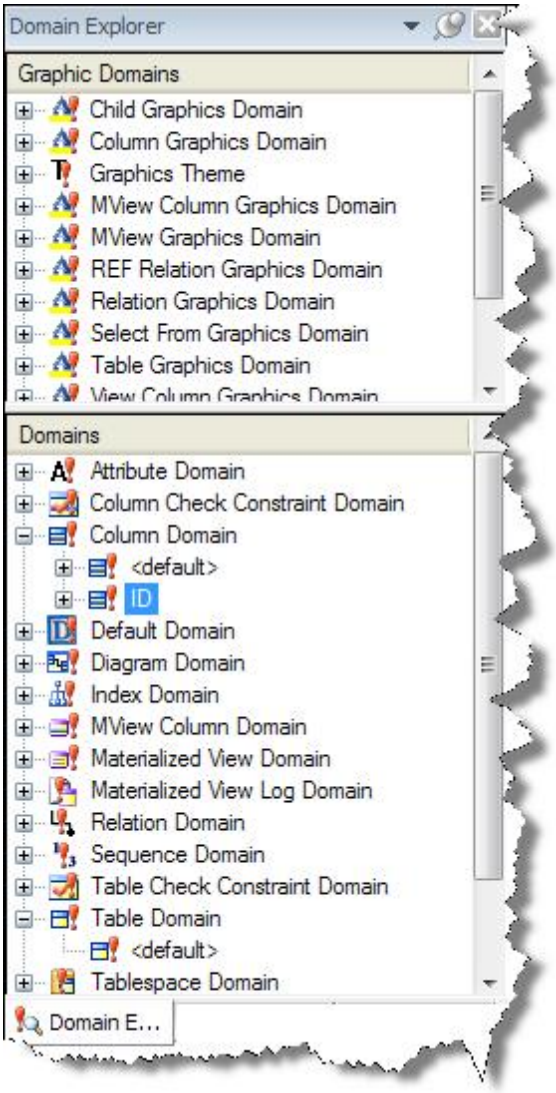

How Templates Work

An easy to visualize example is a Diagram Template. If you select a Diagram in the Diagrams section of the Model Explorer and then look at its properties in the Property Browser, you will see that it Inherits from the <*default*> Diagram Template. Various <*default*> Templates are automatically created with every Model and can't be deleted. They define the default properties for all objects of the Template's type. i.e. the <*default*> Diagram Template defines the default properties for all Diagrams. If you click on the "Inherit" link, the <*default*> Diagram Template will become the currently selected object, and its properties will now be displayed in the Property Browse pages. If you then change the Background Color to light blue, then all of you Diagrams will now have a light blue background - since they all inherit this property from the <*default*> Diagram Template. If you create a new Diagram, it will also have a light blue background - since it will be initialized to inherit its properties from the <*default*> Diagram Template. If you change the Background Color property of the <default> Diagram Template to red, then all your Diagrams will have a red background, etc...

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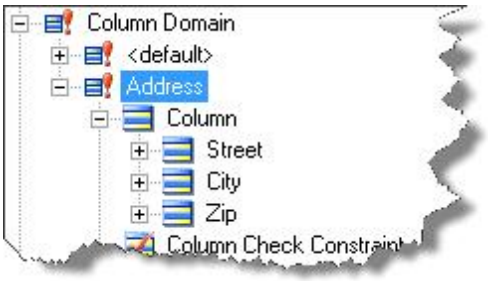
An object "overrides" an inherited property when you modify that property on the object. So, if you again select a Diagram in the Diagrams section of the Model Explorer (or by navigating back to the one you had just selected) and change the Background Color of the Diagram to grey, you will have created a "local" property on the Diagram that "overrides" the inherited property. Now this Diagram will no longer use the inherited property and any changes made to the <*default*> Diagram Template's Background Color won't effect this Diagram. If you want to remove this local property/override, you can select the Reset tab in the Property Browser and click the icon next to the Background Color property. By the way, you can't delete the <*default*> Diagram Template's Background Color property since ModelRight enforces the fact that some value is needed for this property - hence this property doesn't even appear on the Reset page for the <*default*> Diagram Template.

Not only can a regular object inherit from a Template, but a Template can inherit from another Template. i.e. a Diagram Template can inherit from another Diagram Template. This allows you to create a classification scheme as a hierarchy of Templates with each level contributing more properties and effectively adding more specificity.

Column Groups

ModelRight 4.0 allows you to add Columns as children of a Column Template. Any Column that then "inherits" from it will also inherit these sub-Columns. This allows you to define a group of commonly used Column once and consistently reuse them throughout your Model.



Column Domain Address is used to define sub-columns Street, City, Zip.

ModelRight 4.0 also added a Column display option that lets you choose whether to view the Sub-Columns or the Top-Level Columns on the Diagram. This option is found under Content Display options for Columns.

Table Template Columns

You can also add child Columns to a Table Template. Any table that then inherits from the Table Template will also contain those columns. For example, if you wanted every Table in your Model to contain a Create_Date and a Modify_Date Column. You could accomplish this by simply adding these Columns to the <default> Table Template.

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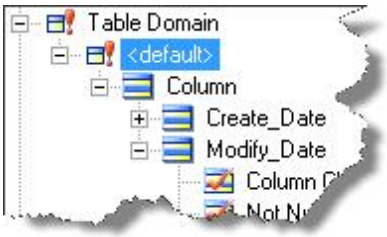
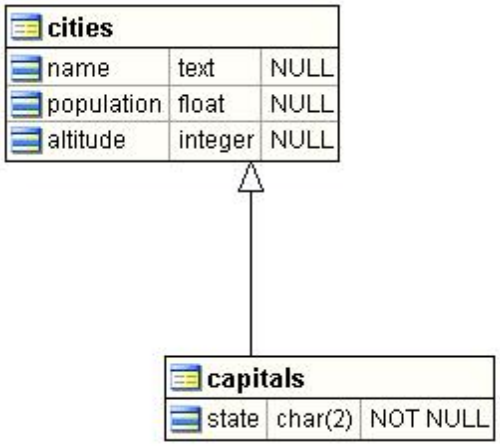


The <default> Table Domain with create_date and modiy_date sub-Columns.

Table Inheritance

A Table can now inherit from another Table as well as a Table Template. Inheritence relations are displayed on Diagram with an arrow Relation. All Columns and Table Check Constraints are inherited by the Table.



ModelRight 4.0 also adds a corresponding Column display option that allows you to specify whether inherited Columns are displayed on the Diagram or not. This option is found under Content Display Options for Columns.

4.3 Scripting

ModelRight implements a COM/ActiveX interface for accessing and manipulating a model's objects and properties programmatically. It uses this interface internally from VB Scripts to generate DDL. You can write your own VB Scripts that use this within ModelRight to generate DDL, create reports, perform custom validation, do batch processing, etc...

The scripting engine resides in a DLL named SCF.DLL. If you want to access your Model's

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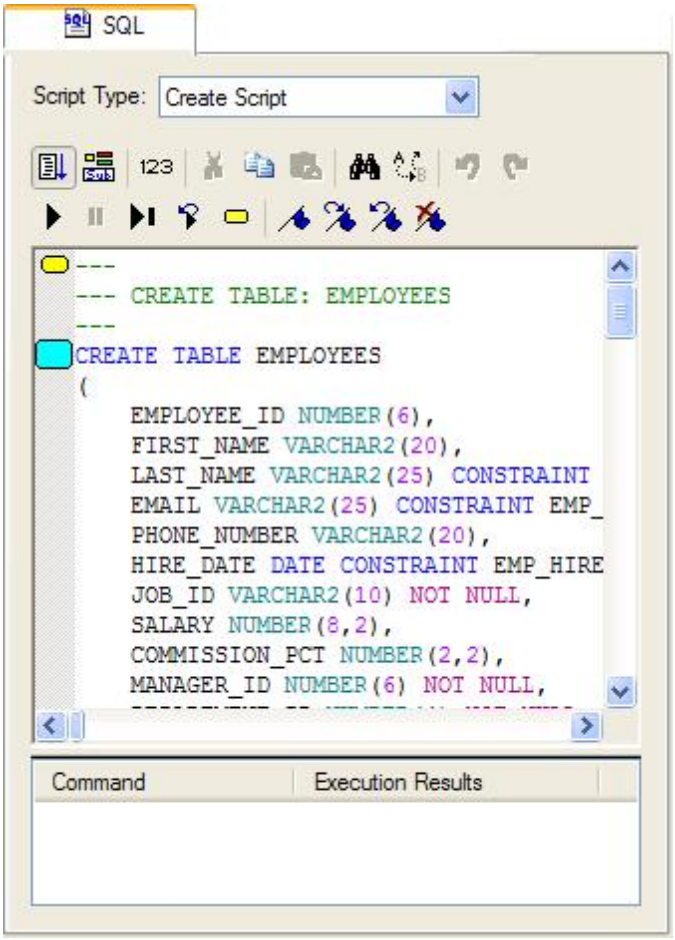
information outside of ModelRight, you need to register this DLL (i.e. regsvr32 SCF.DLL). You can then use VB Script, JavaScript or any other programming language that can communicate with a COM/ActiveX control to access your Model's information. You could even write an HTML page that loads a model and generates the page based on its contents. For a simple example, see the sample JavaScript program SampleJavaScript.htm in the Report Files folder.

4.3.1 VB Scripts

If you select a Table and then click on the SQL *SQL tab in the Property Browser, you will see the corresponding CREATE TABLE statement.*



SQL Property Page with the Run Script button selected

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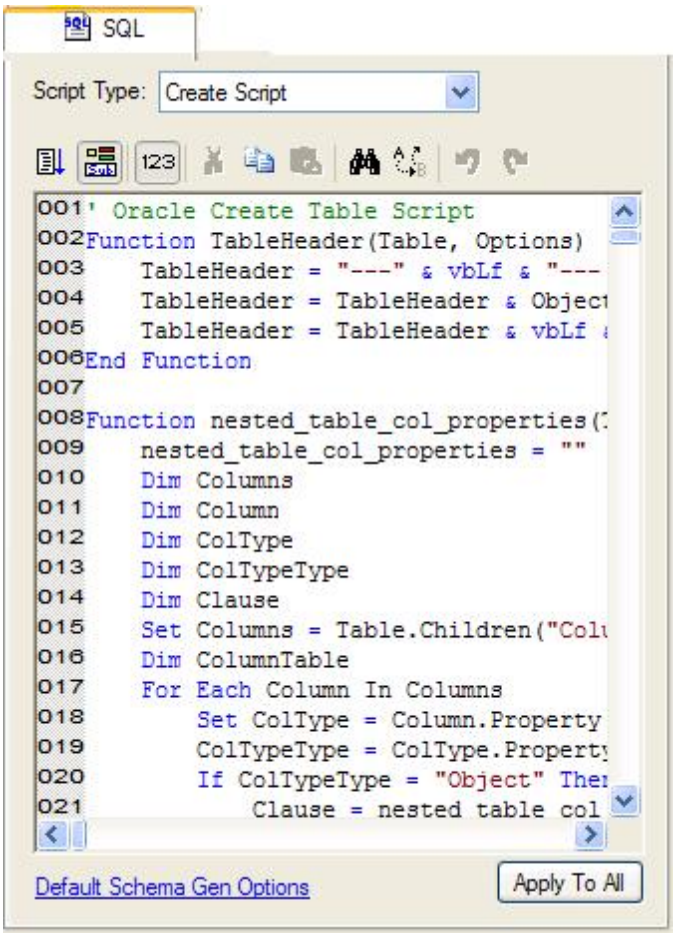
SQL
Script Type: Create Script
001' Oracle Create Table Script
002Function TableHeader(Table, Options)
003 TableHeader = "---" & vbLf & "---
004 TableHeader = TableHeader & Object
005 TableHeader = TableHeader & vbLf
006End Function
007
008Function nested_table_col_properties(
009 nested_table_col_properties = ""
010 Dim Columns
011 Dim Column
012 Dim ColType
013 Dim ColTypeType
014 Dim Clause
015 Set Columns = Table.Children("Colu
016 Dim ColumnTable
017 For Each Column In Columns
018 Set ColType = Column.Property
019 ColTypeType = ColType.Property
020 If ColTypeType = "Object" Then
021 Clause = nested table col
Default Schema Gen Options
Apply To All

SQL Property Page with the Edit Script selected

ModelRight generates the CREATE TABLE statement, and any other DDL statement, by evaluating a VB Script in the context of the given object (in this case the Table you selected). This section describes how this is accomplished and the many ways you can customize it.

Any object that generates DDL for has a SQL Property Page. If you select the object and then select the SQL Property Page (i.e. the SQL SQL tab in the Property Browser) you will see the DDL that resulted from evaluating a VB Script. If you then select the Edit Script button in the page's toolbar, you will see the VB script that was evaluated.

When ModelRight needs to generate DDL, it first needs to determine what VB Script to evaluate. It attempts to find a VB Script by performing the following steps:

1. if the object being evaluated has a value for the script, use it.
2. if the Template that the object inherits from has a value for the script, then use that.
3. use the corresponding Script object in the Script Explorer. When ModelRight starts up, it looks for VB Scripts that have been stored in files under the "Scripts" sub-directory (beneath the executable's directory). If it finds any, then it stores this internally as the default script value. This way all models will use the given script as the default. If it doesn't find a script file, then ModelRight will load the script from an internal resource.

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Hence, changing a VB Script in different areas of the product will affect the DDL that different objects produce:

- **Individual Object** - If you want to change the VB Script for just one object, then select the object, go to the SQL Property Page, click the Edit Script button in the page's toolbar, and make changes to the VB Script in the edit control provided. This creates a local value for the given script property. If you then decide that you want to use this VB Script for all objects (of the given type in the model), click the "Apply To All" button. This will removed the local value and set it on the corresponding Script object in the Script Explorer.
- **Template Level -** if you want the change the VB Script for all objects that inherit from a given Template, change the script in the SQL Property Page of the Template.
- **Script Objects -** Select the Scripts tab at the bottom of the Model Explorer bar. Navigate down the Database tree to the type of object and type of script that you want to change. Script values entered here will be used as the default script for all objects of the given type.
- **File -** If you enter a value for a Script object as described above, then you can right click on it in the Script Explorer to bring up a context menu. Select "Save To Disk" to save the script to file, it will then be used as the default across models.

Script Explorer

The Script Explorer is located under the Scripts tab of the Model Explorer. It contains the Script Categories and Script objects that are used for schema generation and other purposes. Script objects under the database category provide a place to view and change the model-wide default VB Script values. If you modify the text of a Script object, it will effect the DDL generated for all objects of the given object type (like Table) for the given property (like Create Statement). If you would like to apply that change to all models, bring up the context menu (by right clicking on the Script in the Script Explorer) and select Save To Disk.

GlobalNamespace Script

ModelRight appends the contents of the built-in Script named GlobalNamespace to any other script that it executes. i.e. this is the place where you can add a scripting function that can be re-used by all of the other scripts.

Pre and Post Scripts

These scripts will be evaluated before and after the Create Statement.

Ad Hoc Scripts

While VB Scripts are used primarily for DDL generation, you can write scripts to do anything - produce reports, make batch modifications, perform custom validations, etc...

1. **Bring up the the Script Explorer -** select the Scripts tab at the bottom of the Model Explorer

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2. **Create a new Script object -** right click on the User Defined Script Category and select New Script from the context menu

3. **Enter a script**. Here's a sample script that prefixes all Table names with a "T_". The Scripting API is integrated with the internal transaction management system, so after you run the script, make you can hit Undo (and then Redo, etc...).

```
Dim Framework
Set Framework = CreateObject("SCF.ScriptFramework")
Set Models = Framework.ActiveModels
Set Model = Models.Item(1)
Model.BeginTransaction("Batch Rename Tables")
Set Tables = Model.AsObject.Children("Table")
For Each Table In Tables
       Set PropValue = Framework.CreatePropertyValue("Table", "Name")
       PropValue.FromString("T_" + Table.Name)
       Table.SetProperty "Name", PropValue
Next
Model.EndTransaction
```

4.3.2 Script Language API Reference

Having a generic framework of objects and properties organized by a meta-model, allows the scripting API to be simple and generic as well. To do most things, you need to use just a few generic API calls. For example, to get all Columns in a Table, you would simply write "`Table.Children("Column")`". To check any property of any type of object, you would make a call like `Object.Property("Property Name")`. You can use standard VB Script constructs to iterate over collections, as in the following example which iterates over all Tables and prefixes the Table with "T_".

```
Dim Framework
Set Framework = CreateObject("SCF.ScriptFramework")
Set Models = Framework.ActiveModels
Set Model = Models.Item(1)
Model.BeginTransaction("Batch Rename Tables")
Set Tables = Model.AsObject.Children("Table")
For Each Table In Tables
       Set PropValue = Framework.CreatePropertyValue("Table", "Name")
       PropValue.FromString("T_" + Table.Name)
       Table.SetProperty "Name", PropValue
Next
Model.EndTransaction
```

API Reference

ScriptFramework

```
Object CreateObject(String Type, Object Owner)
Bool DeleteObject(Object Object)
Object CreatePropertyValue(String ObjType, String PropType)
Object LoadModel(String ModelPath)
SaveModel(String ModelPath, Object Model)
Initialize
Object MetaModel
Object CreateObjectById(Long Type, Object Owner)
```

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```
        Object CreatePropertyValueById(Long ObjType, Long PropType)
        Object Model(String ModelId)
        ModelCollection ActiveModels
        Object CreateModel
        String Evaluate(String Property)
        Object CurrentModel
        Object CurrentSelection
        Object CurrentDrawableSelection

ScriptContext
        ScriptDocument ScriptDocument
        Object Object
        Object Options

ScriptDocument
        Write(String Val)

Object
        String Name
        Object Property(String Type)
        Collection Children(String Type)
        String CreateStatement
        Bool HasProperty(String PropType)
        String AlterStatement
        Object Owner
        Long Id
        Long Type
        String TypeName
        Bool IsValid
        Bool SetProperty(String Type, Object Prop)
        Bool DeleteProperty(String Type)
        String DropStatement
        Collection Properties
        Property PropertyById(Long PropType)
        Collection ChildrenById(Long ObjType)
        Bool SetPropertyById(Long Type, Object Prop)
        Bool DeletePropertyById(Long PropType)
        Bool HasPropertyById(Long PropType)
        Model Model
        Collection AllChildren
        String Evaluate(String Property)
        Bool Equals(Object Obj)
        Collection ModifiedProperties
        Collection ModifiedChildrenPosition
        Property OriginalProperty(String Type)
        Collection OriginalChildren(String Type)
        Bool HasLocalProperty(String PropType)
```

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```
      Bool HasLocalPropertyById(Long PropType)
      Object OldOwner

ObjectCollection
      Object Item(Long Index)
      Long Count

Property
      Long Type
      String Name
      Object Value

PropertyCollection
      Property Item(Long Index)
      Long Count

PropertyValue
    String AsString
    Bool AsBoolean
    Long AsInteger
    Double AsDouble
    Object AsObject
    Collection AsVector
    Bool IsStringProperty
    Bool IsBooleanProperty
    Bool IsIntegerProperty
    Bool IsDoubleProperty
    Bool IsObjectProperty
    Bool IsVectorProperty
    Bool IsNull
    FromString(String Val)
    FromBoolean(Bool Val)
    FromInteger(Long Val)
    FromDouble(Double Val)
    FromObject(Object Val)

VectorPropertyValue
    Object Item(Long Index)
    Long Count
    AddValue(Object Val)

ChildOrderItem
      Object Child
      Long NewPosition
      Long OldPosition

ChildOrderItemCollection
      Object Item(Long Index)
```

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```
      Long Count

Model
      String Name
      Object AsObject
      Object MetaModel
      String Id
      BeginTransaction(String pVal)
      EndTransaction
      RollbackTransaction
      Undo
      Redo

ModelCollection
      Model Item(Long Index)
      Long Count

MetaModel
      Collection MetaObjects
      MetaObject MetaObjectById(Long type)
      MetaObject MetaObject(String Type)

MetaObject
    Long Type
      String Name
      Collection MetaObjects
      Collection MetaProperties
      MetaObject MetaObjectById(Long type)
      MetaObject MetaObject(String Type)
      MetaProperty MetaPropertyById(Long type)
      MetaProperty MetaProperty(String Type)

MetaObjectCollection
      MetaObject Item(Long Index)
      Long Count

MetaProperty
      Long Type
      String Name

MetaPropertyCollection
      MetaProperty Item(Long Index)
      Long Count
```

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4.4 Migration, Unification, and Rolenaming

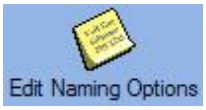
ModelRight automatically creates Columns in a Relation's child Table for certain Columns in the parent Table. This is referred to as Migration. By default, ModelRight migrates the Columns in the parent Table's primary key (you can also migrate a unique key) to be "foreign key" Columns in the child Table. This ensures that you can use a foreign key constraint (i.e. the CREATE FOREIGN KEY statement) to enforce referential integrity declaratively (vs programmatically with a Trigger).

Even after a foreign key column is created, ModelRight will automatically update it when certain changes are made to the parent Column - like name and datatype changes. If you want to give the migrated Column in the child Table a different name, you can "rolename" it. Once rolenamed, name changes made to the parent Column's name will no longer effect the name of the child Column.

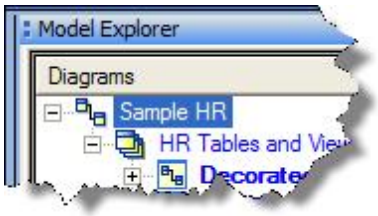
If two relations contribute child Columns with the same name, ModelRight will automatically "unify" them into a single Column in the child Table.

See the Relation Migrate Property Page for more details.

4.5 Naming

Naming options are a property of the Model. So if you select the Model object at the top of the Model Explorer or select Edit Naming Options 

in the Shortcut Taskbar you will see the Naming tab in the Property Browser.



Select the current Model to get to the Naming page

The Naming page allows you to specify various constraints on the names used in your Model.

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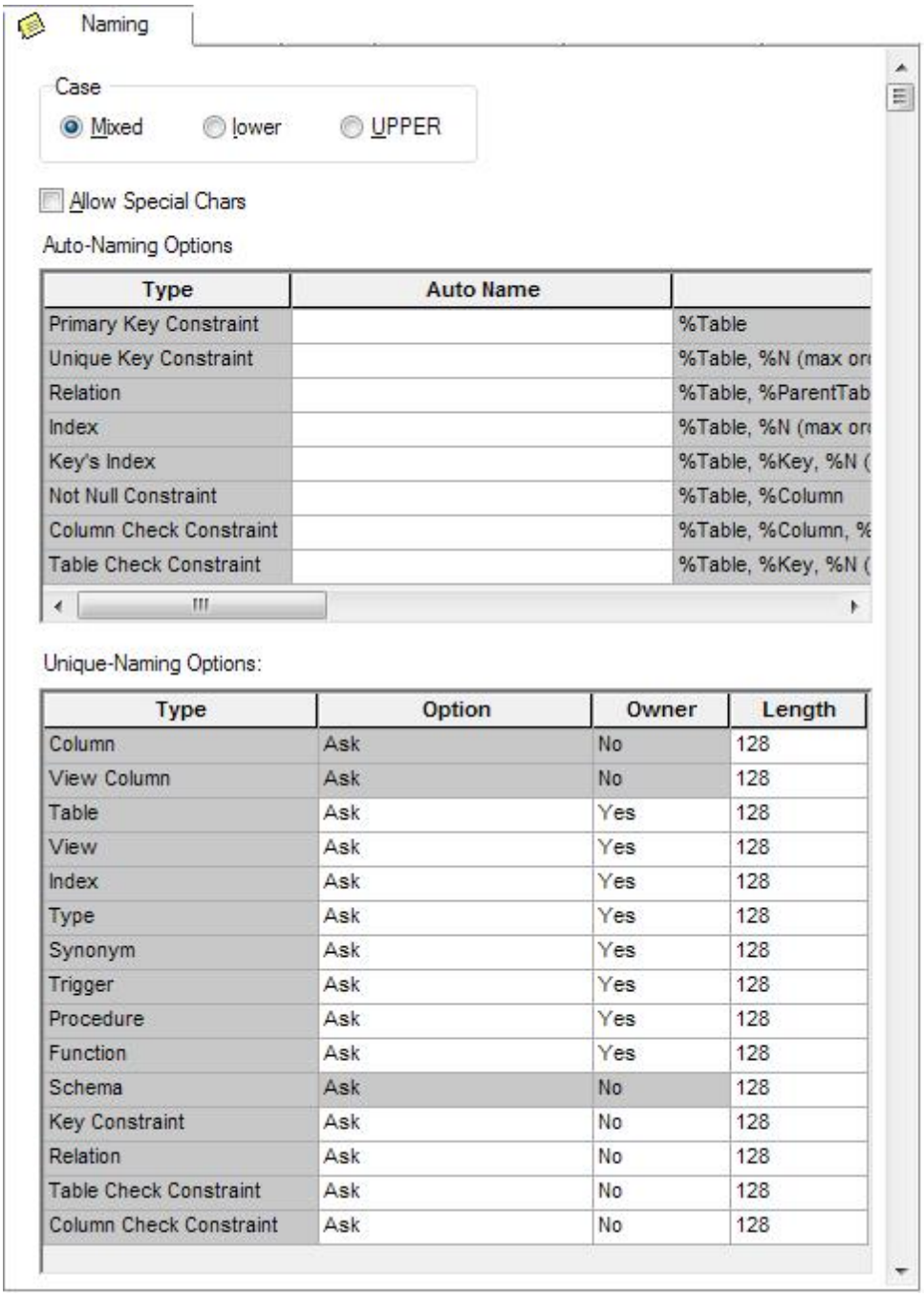

Auto Naming Options - use these options to auto-generate more meaningful default names for FK Columns, PK , UK , FK, Check constraints and Indexes. You can use the "macros" listed to form a name based on related object's name. For instance, to name relationships as ParentTableOfRelation_ChildTableOfRelation you can enter “%ParentTable_%ChildTable” in the Auto Name column for Relation. The Auto Names option is applied only to names that you have not explicitly named (for instance, names given to new objects). If an object already has a user-defined name then it needs to be Reset before the Auto Name value will be applied.

Auto generated names will be kept up to date if any related object names change. Also, if the

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Auto Name is changed to some different macro combination then all the generated names will be re-generated according to the new auto name definition.

Unique Naming Options - specify what ModelRight should do if there is a unique name conflict. The Owner option specifies whether ModelRight should take the object's Owner/ Schema into consideration when determining whether a name is unique.

Case - lets you specify that Names should have a Mixed, lower or UPPER case. lower and UPPER will change your existing names and enforce the case. Mixed has no effect on the names.

Allow Special Chars - if checked, special characters (non alpha-numeric) in names will be replaced with an underscore

Naming Options by Type - **Option** and **Owner** are unique naming options and are provided on a type by type basis. For each different type of database object, you can specify what happens when there are name conflicts (two names with the same value): Allow, Disallow, Ask, Auto Rename. The **Owner** option is provided for types of objects that have an owner. A value of Yes means the Owner of the object will be used to determine whether the name are unique or not. i.e. OWNER1.TABLE1 and OWNER2.TABLE1 would be considered unique.

4.6 User Defined Properties

ModelRight lets you add your own properties to any kind of object. You can then specify a value for each object that uses your property.

You first need to create a new User Defined Property object. The Property Browser will then display the following edit page:

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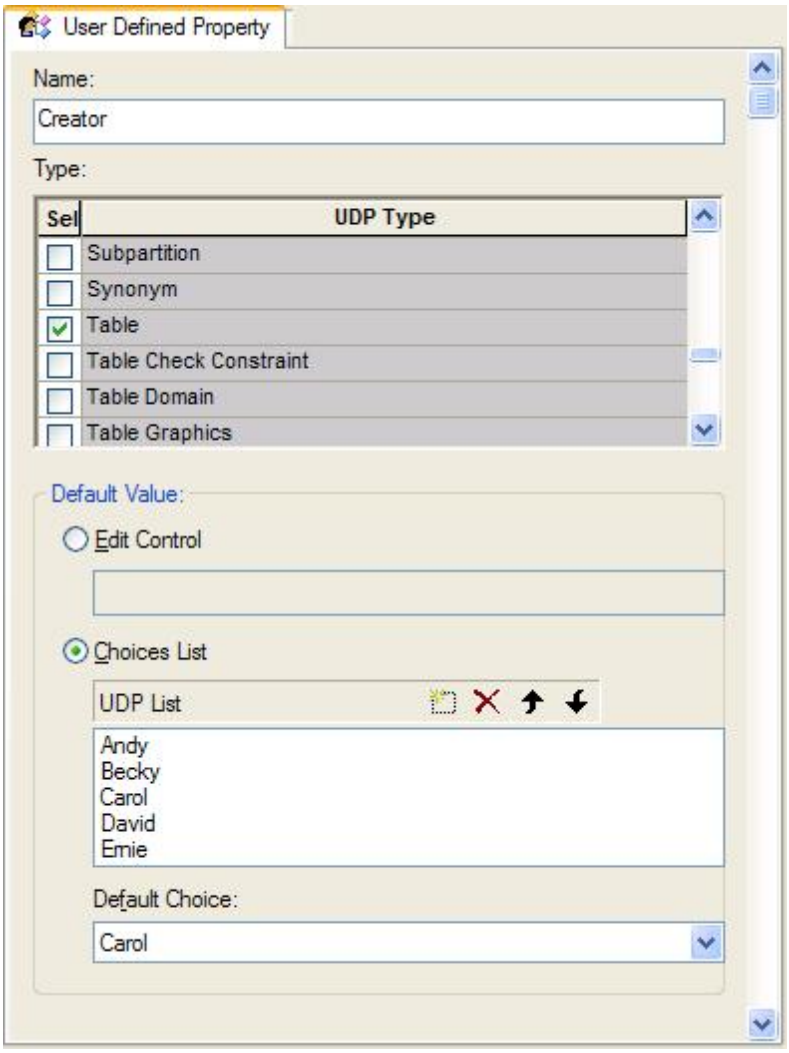
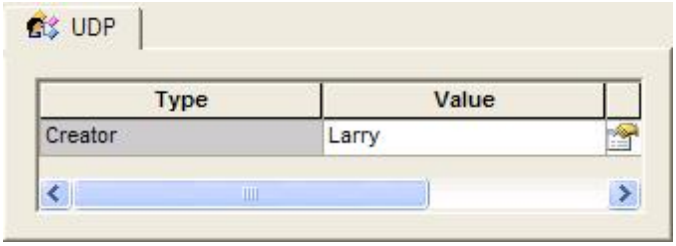


The main purpose of this page is to let you specify what type of objects you want to use your User Defined Property. You would use the **Type** grid to specify this. You can select multiple object types for each User Defined Property. When you select a type of object, then you can specify a value for your User Defined Property for each object of that type. i.e. whenever you edit an object of that type, a UDP Property Page will be displayed with your User Defined Properties displayed and editable.

For example, the above screenshot shows a User Defined Property called Creator that is being used by Tables. Now whenever a Table is selected, the Property Browser will add a tab called UDP which displays and allows you to edit a value for Creator:



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You can specify a default value for your User Defined Property. If you specify **Choices List**, then when you edit an object's UDP values, a combo box will display all the choices that you entered. Otherwise, an edit control is used.

4.7 Relations

ModelRight lets you create several different kinds of Relations:

- Table Relations
- View Relations
- Select From Relations
- REF Relations

4.7.1 Table Relations

The most common type of a Relation is a Table Relation (or just Relation). It is a Relation between two Tables. It is usually used to enforce referential integrity between the Parent Table and the Child Table. Referential integrity is enforced by the database and means that certain child Columns must form a reference to a row in the Parent Table.

Relations are represented in a Diagram with a Relation Graphic object. A Relation Graphic Template is provided so that you can categorize your Relations and easily change the appearance of all of them.

You can toggle the display of all Table Relations in the Diagram's Relation Display Options Property Page. You can also toggle the display of any individual Relation by selecting the Relation, then selecting the Graphic tab in the Property Browser, and toggling the Display checkbox.

See Also

Migration, Unification, and Rolenaming

Relation Property Pages

Diagram Relation Graphics

Oracle Manual - Referential Integrity

4.7.2 View Relations

A View Relation is very similar to a Table Relation, except the Child of the Relation is a View. A View Relation has the same properties as a Table Relation, however the database does not enforce the referential integrity of a View Relation. i.e. in Oracle it must always be created as DISABLE NOVALIDATE. Hence, View Relations are primarily used just for documentation purposes.

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View Relations are represented in a Diagram with a View Relation Graphic object. A View Relation Graphic Template is provided so that you can easily change the appearance of all View Relations.

You can toggle the display of all View Relations in the Diagram's Relation Display Options Property Page. You can also toggle the display of any individual Relation by selecting the Relation, then selecting the Graphic tab in the Property Browser, and toggling the Display checkbox.

4.7.3 Select From Relations

A Select From Relation (From Relation for short) is used to specify the name of a Table or View in the FROM clause of a Select statement. A Select From Relation is a Relation in which the child is a Select object (which is owned by a View) and the parent is a Table or View. In ModelRight, a View can be composed of several Selects (combined using some operator, like UNION).

Select From Relations are represented in a Diagram with a Select From Graphic object. A Select From Graphic Template is provided so that you can easily change the appearance of all Select From Relations.

You can toggle the display of all Select From Relations in the Diagram's Relation Display Options Property Page. You can also toggle the display of any individual Relation by selecting the Relation, then selecting the Graphic tab in the Property Browser, and toggling the Display checkbox.

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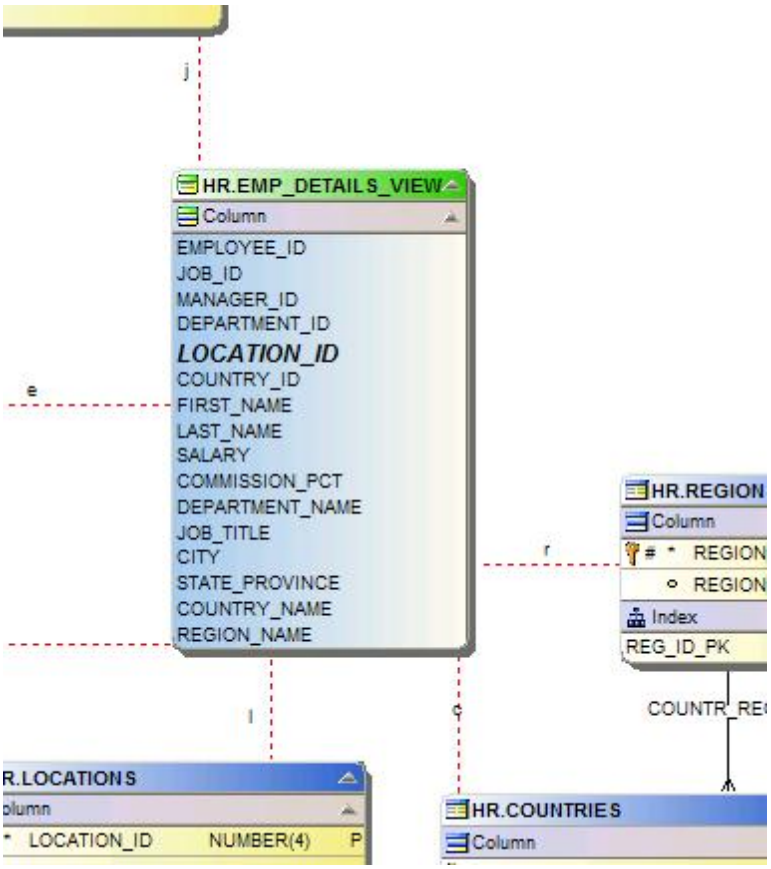

This screenshot shows a view with a number of From Relations. By default, From Relations are drawn with a red dotted line.

4.7.4 REF Relations

A REF Relation is only supported for those databases that have Object-Relational features and support the REF datatype. A REF relation is automatically associated with a Column that has a datatype of REF and has been constrained to be scoped to a specific object table (similar to a traditional referential integrity constraint). The REF Relation's parent Table is the referenced object Table and the Relation's child Table is the owner of the REF Column.

You can't create or delete a REF Relation. It is automatically created and deleted based on the REF Column and its properties. However, you can toggle the display of all REF Relations in the Diagram's Relation Display Options Property Page. You can also toggle the display of any individual Relation by selecting the Relation, then selecting the Graphic tab in the Property Browser, and toggling the Display checkbox.

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Part V

5 Basic Working Procedures

This section describes the most common basic tasks you will use when working with ModelRight. It is designed as a "How-To" guide. You can use the table of contents as an index. Although it is organized roughly in the order that you would perform the tasks you don't need to begin at the beginning and work your way through. Every topic contains comprehensive links to background information and other relevant subjects so you can just pick out the task you need to perform and begin.

The topics in this section are intentionally kept as brief as possible. The focus is on how to do what you need to do. More detailed background information on many subjects is provided in other areas.

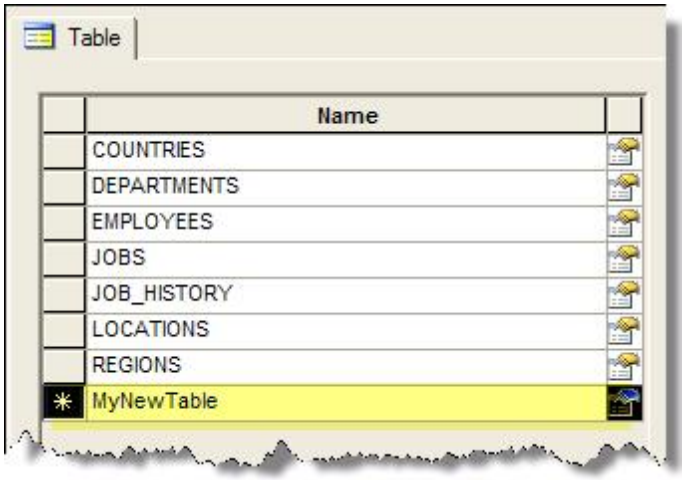
5.1 Creating new objects

Creating a new object:

Choose from the following ways to create a new object:

1. Select the object's category in the Model Explorer (in this case the Table category)...

...and then enter the name of the new object in the Category editor of the Property Browser.



2. Select the object's category or any existing object in the Model Explorer...

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...right click to bring up the context menu and select New...

... a new object will be created and you will be placed in edit mode of the new object's name.

3. select an object of the type you want to create in either the Diagram or the Model Explorer. Then in the Property Browser's toolbar hit the Create New Object button.

In the case of creating a table (or view), you could also:

1. Select Create Table in the Shortcut Taskbar:

2. Select the Create Table button in the Objects Toolbar. Then click on the place in an open Diagram where you want the new Table to be located.

This will create a new Table and add it to the Diagram where you clicked.

Creating a new Model:

Select New in the File menu (or click on in the Toolbar) to create a new Model. If a non-empty Model is already loaded, ModelRight will start another instance of

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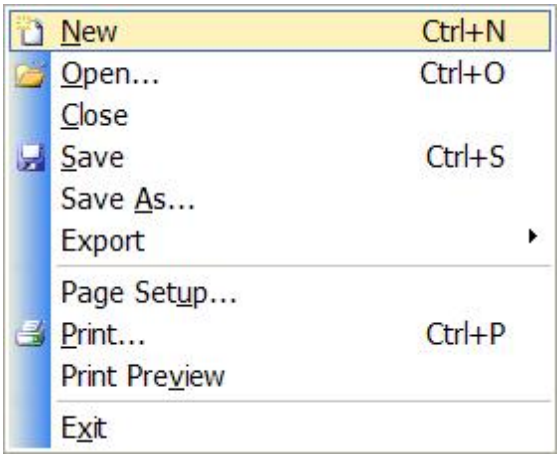
itself with an empty Model.



5.2 Copy/Paste and Drag/Drop

ModelRight supports Copy/Paste and Drag/Drop within Model or between Models. Also ModelRight supports these operations within or between the Diagram and the Model Explorer. Generally, if you have Ctrl pressed while you move a selection, it is considered a copy gesture.

These operations are used to support the following scenarios:

Action	Result
re-ordering - move an object within its parent object	change the order of the selected object within its parent object. In the case of Columns, the order that is affected is whatever order is being displayed (Generation or Pk/Non-Pk). If displaying in Pk/non-Pk order, dragging a Column from the non-Pk part of a table to the Pk part will make add the Column to the Pk - an vice versa. For most other objects, the Generation order is affected. Tables and Views can not be re-ordered since their order is determined dynamically based on their relations.
copy any object that is owned by the Model to the same or another Model	creates a copy of the selected object(s)
copy a simple graphic (rectangles, text, lines, etc...) to a Diagram	creates a copy of the Graphic
copy or move Table/View or MView to the same or different Model	creates new object(s)
move Table/View or MView to a Diagram or Model Subset	adds the object to the Model Subset

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copy or move a Column Template to a Table	creates a new Column based on the Column Template
copy or move a Column to a Table	copies or moves the Column to the Table
move a Column to an Index or Key Constraint	adds the Column to the Index or Key Constraint
move a Tablespace to a Table/View	sets the Table's Tablespace property
move a User to to a Table/View	sets the Table's Database Owner property
drag/drop a relation endpoint	changes the Relation's child or parent Table

5.3 On-Diagram Editing

As described below, ModelRight has extensive on-diagram editing capabilities that allow you to create, modify, or delete displayed objects:

Current State	**Action**
Table (or View) is selected	• Hitting Enter or Selecting the Table Name again will start editing the Table Name property. • You can select one of the Table's Columns (or any of a Table's child objects) or Category Headers • Hitting Tab (or Down Arrow) will take you to the next editable object within the Table. Hitting Shift+Tab (or Up Arrow) will take you to the previous editable object in the Table. • Shift+Up, Down, Left, Right move the Table in that direction • Hitting Control+Enter creates a Column
Editing a property	• Hitting Enter will Commit the changes and end Edit mode. • Hitting Esc will Cancel the changes and end Edit mode. • Hitting Tab (or Down Arrow) will commit any changes and take you to the next editable property within the Table. Hitting Shift+Tab (or Up Arrow) will commit any changes and take you to the previous editable property in the Table.
Column (or any of a Table's child objects) is selected	• Hitting Enter will start Edit mode on the object • Selecting a displayed property will start Edit mode on the selected property • Hitting Tab (or Down Arrow) will take you to the next editable object within the Table. Hitting Shift+Tab (or Up Arrow) will take you to the

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	previous editable object in the Table. • Hitting Ctrl+Up/Down will move the Column up/down in its sibling order. If you are displaying the Table's Columns in PK/non-PK Order and this causes the Column to cross the PK/non-PK separator, then the Columns will be added/removed from the PK. • Hitting Ctrl+Enter will append a new Column. Hitting Shift+Ctrl+Enter will insert a new Column.
Editing with a combo box	• Hitting Alt+Down Arrow will cause the combo box to drop (i.e. display its selections). You can then use the Down/Up arrows to navigate the combo box entries.
Category is selected	• Hitting Ctrl+Enter will create a new object. • Hitting Enter will expand or collapse the category, if the Diagram's Expand/Collapse Icon option is turned on.
Expand/Collapse Icon is selected	• The corresponding Category or Table will collapse or expand.
Any object is selected	• Hitting the Delete button will delete the selected object(s)
	mouse wheel scrolls Diagram, middle mouse click starts dynamically panning diagram based on current mouse position, Ctrl+middle mouse, then mouse wheel zooms in or out
nothing selected	arrow navigation keys - up, down, right, and left arrows scroll the Diagram

5.4 Reporting

ModelRight can be thought of as the source of data for a report. It contains all of the Model objects and properties that you may want to include in your report. ModelRight generates reports by first generating XML data containing whatever model information you want. That XML is then transformed using XSL into whatever report format you like - HTML or RTF, etc... XML and XSL are W3C standards.

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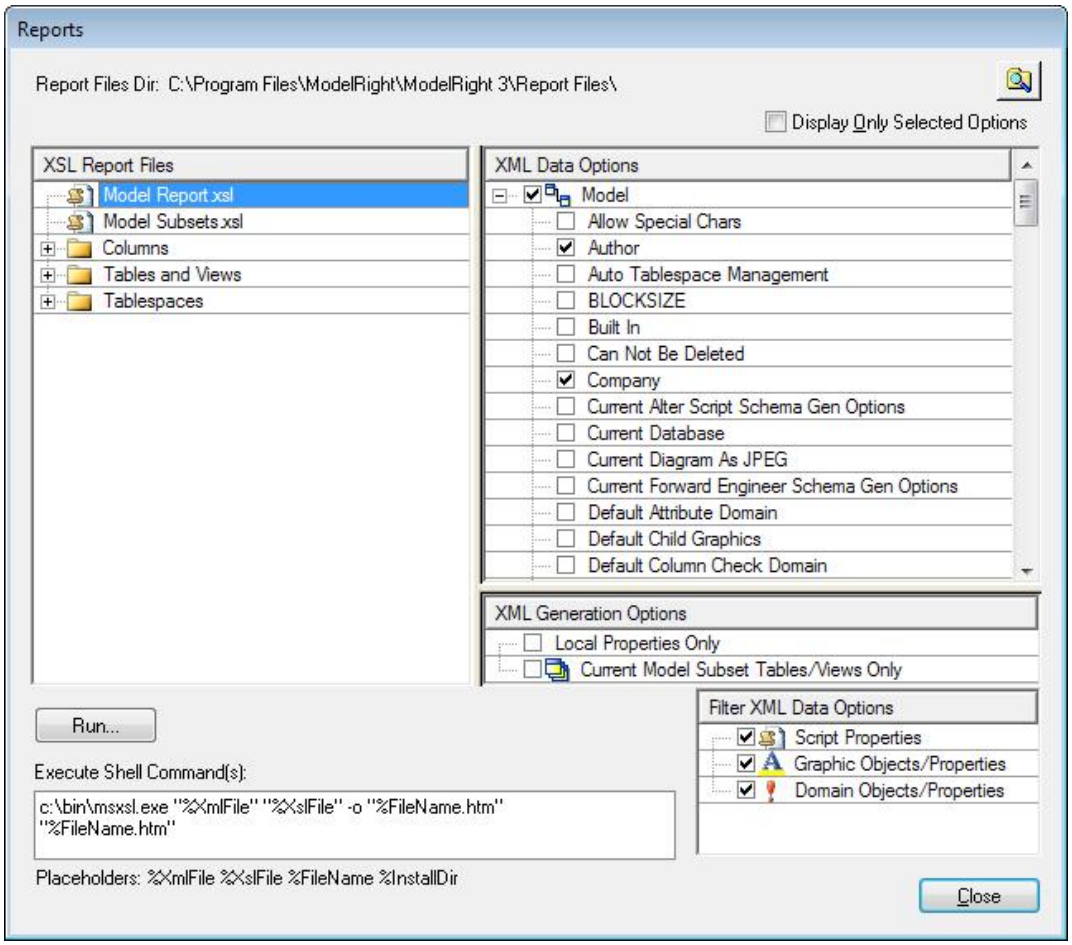

ModelRight provides several sample reports in the form of XSL files that are listed in the **XSL Report Files** control. An XSL file contains the XSL code for creating a report from XML data. For it to work properly, specific XML data must be contained in the XML file that it is applied to. For example, if the XSL code is designed to create an HTML table of all Materialized Views in the Model, then the XML data needs to have information about the Model's Materialized Views in order for the XSL to work properly. The **XML Data Options** allow you to specify the XML data that ModelRight should generate - i.e. the XML data that the XSL file requires. ModelRight saves your **XML Data Options** and **XML Generation Options** selections as comments in the XSL file to make it clear what XML data the XSL file requires and so that the report specification is packaged in a single file.

To change the report output, you need to edit the XSL code that constitutes your report file. The sample report file "Model Report.xsl" illustrates many ways to navigate and transform the ModelRight XML content. Also, check out the Downloads section of the website for report files that others have contributed. Or send ModelRight support an email describing what you would like in your report and we will try to provide it for you.

The Reports builder dialog provides the following controls to help generate reports:

XSL Report Files - lists all of the XSL files in the current Report Files directory (and sub-directories). The current **Report Files Dir**ectory is displayed at the top of the dialog. To change it, you can click the **Browse for Folder** button in the upper right corner of the dialog

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and browse to another directory. When you select a folder, ModelRight will scan that directory and any sub-directories looking for XSL files and display the results in the **XSL Report Files** control.

XML Data Options - a tree of all of the different types of objects and properties used in the product. Select the items that you want to be included in your report. When you run a report, ModelRight will create an XML file that contains data for the options that you selected.

XML Generation Options - options that qualify the XML data that is generated

- **Local Properties Only** - generate data only if the property is locally defined on an object (vs. being inherited or calculated).
- **Current Model Subset Tables/Views Only** - generate Table/View information only for the currently active Diagram

Filter XML Data Options - The list of XML Data Options is extensive and can be a little hard to wade through. These options are provided to filter the listed objects and properties from display and from generation to the XML data file.

Run - when a report is run, ModelRight will generate an XML file containing the data that has been selected in the **XML Data Options** control. It prefixes that XML data in the file with a processing instruction:

```
<?xml-stylesheet type="text/xsl" href="YourReportFile.xsl"?>
```

where `YourReportFile.xsl` is the name of the XSL report file that you are running. This will cause a browser that opens the XML file to use your XSL report file to view the XML data. ModelRight then launches your web browser and passes the name of the XML data file as a parameter - so the browser will open the file. You could generate an HTML file by using a command-line prompt and an XSL processor, like msxsl:

```
msxsl MyReport.XML MyReport.XSL -o MyReport.HTM
```

...and then open that file in your browser.

Execute Shell Command(s) - Enter an XSL processing application's command line that ModelRight should execute when you run a report. The command should process the XML file into an HTML file (or whatever). You should quote the command and/or arguments if they contains spaces. You can specify multiple commands on separate lines. You can use the placeholders %XmlFile %XslFile %FileName %InstallDir to refer to those items in the command. An example of such a command(s) using msxsl is:

```
"c:\bin\msxsl.exe" "%XmlFile" "%XslFile" -o "%FileName..htm"
"%FileName.htm"
```

Generating Diagrams and Table/View Images

ModelRight supports embedding images of your Diagrams and various other graphics in your HTML reports. See the sample report file `Model Report.xsl` to see examples of each of the following features:

If you select **Model/Current Diagram As JPEG** in the **XML Data Options** control, ModelRight will create a file called `current_diagram.jpg` in a sub-directory called `images` under the current Report File Output directory. The file will contain a JPEG image of whatever the current

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Diagram is.

If you select **Model/Model Subset/Diagram/As JPEG**, ModelRight will generate a JPEG file for each Diagram in each Model Subset that the Model contains. The file will be located in a sub-directory called `images` under the current Report File Output directory and will be called <`diagramid>.jpg` - where <diagramid> is the internal object identifier of the Diagram object. The XML data value of this property will be the file name that was generated.

If you select **Model/Model Subset/Diagram/Table Graphics/As JPEG**, ModelRight will generate a JPEG file containing an image of each Table in each Diagram. The file will be located in a sub-directory called `images` under the current Report File Output directory and will be called <`graphicid>.jpg` - where <graphicid> is the internal object identifier of the Table Graphic object. The XML data value of this property will be the file name that was generated. A similar property is provided Views and Materialized Views.

If you select **Model/Model Subset/Diagram/Table Graphics/Dimensions**, ModelRight will generate the position and dimensions of each Table as it appears in each Diagram. This information can then be used by XSL code to generate an HTML image map for the diagram. A similar property is provided Views and Materialized Views.

Note: the XSL report file usually contains references to images in an images sub-directory. To make sure those references are valid, you need to generate your report to a directory that has the images sub-directory - or create a new images subdirectory under your new report output directory and copy whatever images you are using to it.

5.5 Search and Find

The Find dialog provides a powerful means of searching for objects in your model. You can search by the type of object that you want to find, the property that you want to match, and a value that you want that property to match. For example, the following dialog settings could be used to find all Columns whose Name starts with the letter "S":

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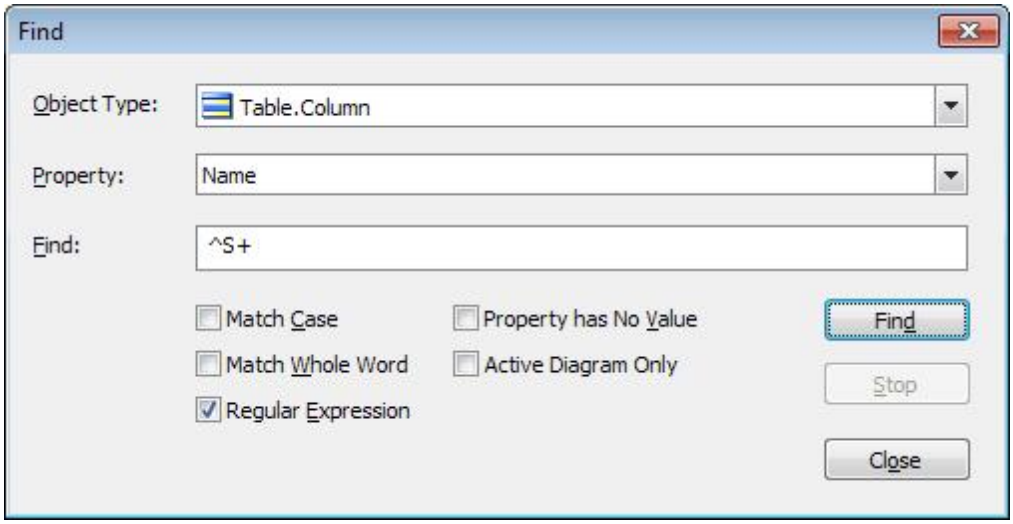
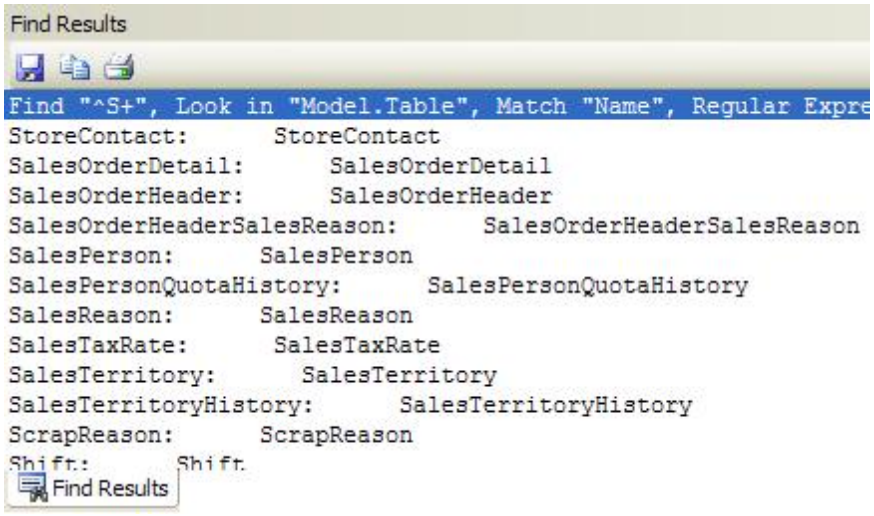


The regular expression syntax that ModelRight uses allows you to specify complex pattern matches.

You can select **Property has no value** to search for objects that don't have a value for the given property - like Tables without a Tablespace or Owner.

The results of the Find are listed in the Find Results window (by default in a tab at the bottom of the application). When you select an item in the Find Results window, the corresponding object is selected. The Find Results window allows extended selections so you can select multiple items and make changes to them all at once (using their Property Pages).



Search Toolbar

What could be more basic? But it is surprising that ModelRight 4.0 is the only product to offer such a basic feature with all the flexibility you need to find any kind of object that matches your search criteria. ModelRight has always had a Find capability to help with this, but now ModelRight 4.0 provides a search control right in the toolbar for even easier access to common searches.

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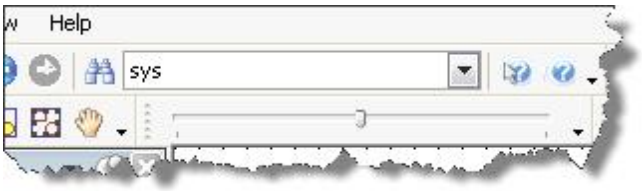

Search control in main toolbar

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Part

6 Database Support

ModelRight supports full-cycle development of your database with the following capabilities:

Forwards Engineer

Generate Change Script

Reverse Engineer

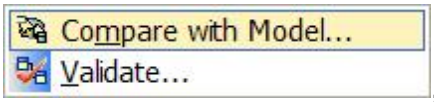
Compare with Database

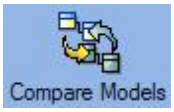
6.1 Compare with another Model

ModelRight can compare your Model with another Model to show and resolve differences between the two. You can export differences from the current/source Model to the target Model to make the target Model more like the source Model, or you could import differences to make the source Model more like the target Model. The Compare with Model wizard is used for both purposes:

How to Compare your Model with another Model:

1. Select **Model** > **Compare with Model** from the menu



, or select 

from the Modeling Tasks section of the Shortcut Toolbar to start the **Compare with Model** wizard.

2. In the first wizard page you can specify the target File/Model that you want to compare with. You can also define the type of objects and properties that you want to compare:

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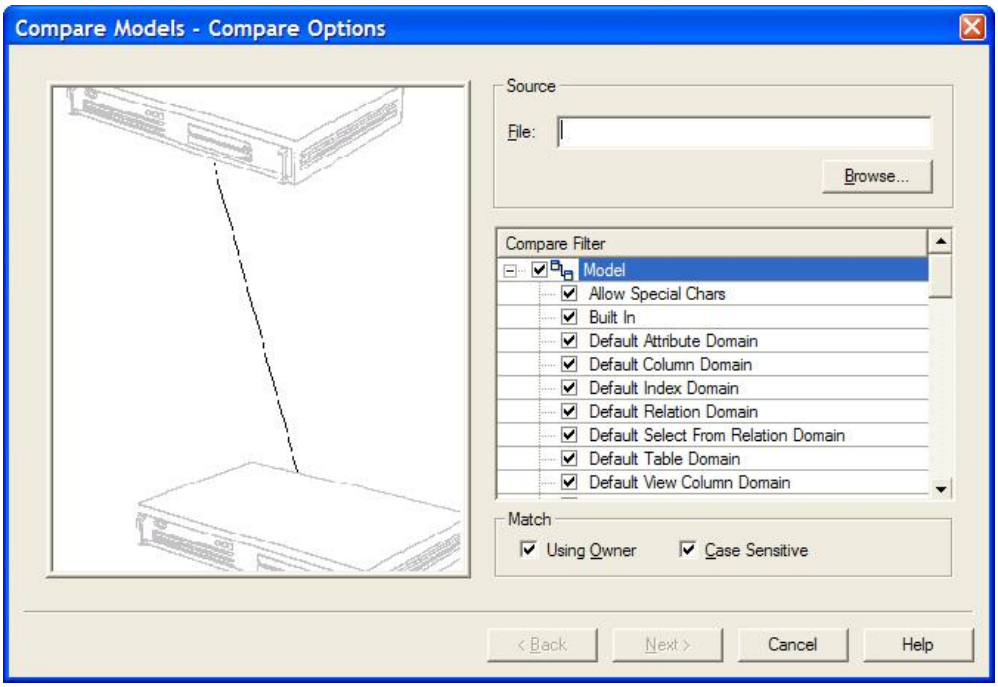

- **File**: enter or Browse for the file that contains the target Model that you want to compare your current/source Model with
- **Compare Filter**: specify the types of objects and properties that you want to compare.
- **Match Using Owner** - after ModelRight loads the target Model, it needs to match up Tables (and Views, etc...) in the source Model with Tables in the target Model. If this option is selected, then a Table's owner must match as well as the Table's name before ModelRight will automatically match them.
- **Match Case Sensitive** - if selected, then the case of the names of objects must match before ModelRight will match the objects.

5. This wizard page shows the differences between your source and target Models. ModelRight will save any changes that you make to the target Model if you click Finish.

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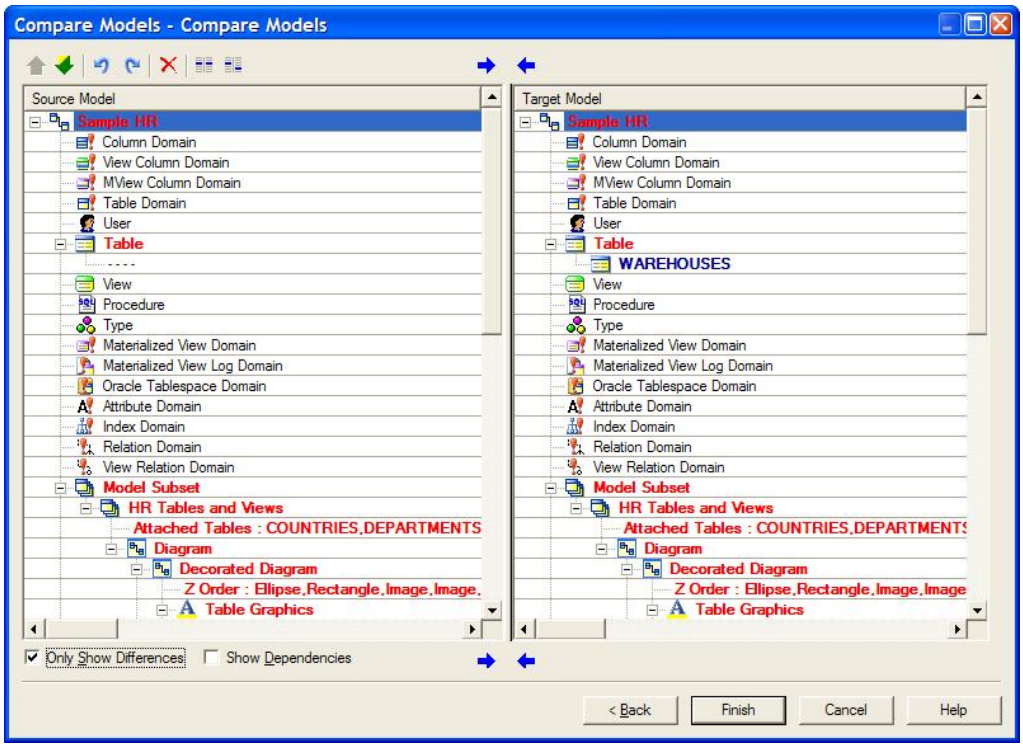

Toolbar Buttons

- export or import a difference. Use the import button to import an object(s) or property into your current Model. When you import an object/property, the action is performed immediately and the comparison trees will be updated immediately with the result(s). Of course you can use the Undo/Redo toolbar buttons that are on the page to undo/redo any changes.

Use the export button to export any source Model object or property to the target Model. If you export an object/property, the action is performed immediately on the target Model and the comparison tree updated to reflect the result.

- go to the previous/next difference

- undo/redo changes that you made

- delete an unmatched object on the Model or database side

- manually match or un-match objects. If ModelRight doesn't automatically match two objects that should be matched (probably because their differences in their names), then you can do so manually. Simply select one of the objects, hit the match toolbar button and select the other object that you want to match. To un-match tow matched objects, select the matched items and hit the un-match toolbar button .

Only Show Differences - if selected, then items that match and are equal are not displayed.

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Show Dependencies - shows all the referenced objects that an object depends on. In some cases, importing/exporting an object's differences will not fully resolve a difference unless its referenced objects are first imported/exported. Selecting this option will cause unresolved dependencies to be displayed under objects in the tree so that you have a visual cue to help you determine what needs to be imported/ exported to resolve differences.

6.2 Supported Databases

ModelRight supports many popular Databases: Oracle, SQL Server, DB2 (zOS and UDB), PostgreSQL, MySQL, Access, and any database via generic ODBC support. ModelRight 4.0 always goes beyond the "least common denominator" approach that most other data modeling tools take to provide extensive and full support for you database.

6.2.1 SQL Server Support

ModelRight 4.0 supports SQL Server 2000, 2005, 2008, 2012 and 2014.

Here is a partial list of the SQL Server objects and properties that are supported in ModelRight 4.0. ModelRight 4.0 can Reverse Engineer, Forward Engineer (Generate SQL DDL), and Compare these objects and properties with an existing database or other Model.

- Tables - SQL Server-specific properties like Filegroups, Text Image Filegroups, Partition Schemes, etc...
- Columns - Computed Columns, SQL Server-specific properties like IDENTITY, Not for Replication, Collation, ROWGUIDCOL, FILESTREAM, Collation
- Views - SQL Server-specific properties like WITH CHECK, ENCRYPTION, etc...
- Indexes - SQL Server-specific properties like Clustered, FILLFACTOR, FILEGROUP, ALLOW_ROW_LOCKS, etc..
- Fulltext Indexes and Fulltext Catalogs
- Key Constraints
- Check Constraints - Table and Column level
- Triggers - DDL and DML
- Types - Alias, External, and Inline
- Defaults - generated as DEFAULTS or inline
- Rules - generates as RULES or Check Constraints
- Partition Schemes and Partition Functions

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- Procedures and Functions
- Assembly
- Synonym
- Schemas
- Template support for many of the above object types lets you categorize and re-use

Note: To connect to SQL Server either select an ODBC data source from the drop down list, enter the name of a server (or server/database or server,port/database, or machine/server/database), or enter a connection string (http://msdn.microsoft.com/en-us/library/ms130822.aspx). If you enter a connection string, then you need to fully specify all the parameters (the server, user, password..)
To create an ODBC data source, bring up the Control Panel, select Administrative Tools, and then select Data Sources (ODBC). Click on the Add button and then the SQL Server driver. Proceed with the rest of the wizard.

Windows Authentication to a remote server is not supported.

6.2.2 Oracle Support

Of course Tables, Views, Columns, and Indexes, etc... are supported, but we add support for many Oracle-specific objects and properties as well.Here is a list of the Oracle-specific features that are supported in ModelRight 4.0.

- Tables - Index-Organized, Partitioning, Sub-Partitioning, Object-Relational, LOB storage options, Oracle-specific Physical Properties
- Views - Object-Relational, any Oracle-specific properties
- Materialized Views, Materialized View Logs, and their Physical Properties
- Columns - Virtual (Oracle 11g)
- Indexes - Bitmap, and Function-based indexes, Local and Global Partitioning, Oracle-specific Physical Properties
- Key Constraints - Unique Key Migration (Primary, Unique, and Foreign Key/Relations)
- Cluster, Cluster Columns and Cluster Indexes
- LOB Storage - Oracle-specific Physical Properties
- Sequence
- Package
- Procedure

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- Function
- Trigger
- Synonym
- Rollback Segment
- Schema
- Object-Relational features: Types, Attributes, Object Tables, Object Views, REF Relations
- Tablespaces, Tablespace Templates, and Datafiles, and their Oracle-specific properties
- Template support for many of the above object types

6.2.3 PostgreSQL Support

Of course Tables, Views, Columns, and Indexes, etc... are supported, but we add support for many Postgre-specific objects and properties as well.Here is a list of the *Postgre*-specific features that are supported in ModelRight 4.0.

- Tables - Table Inheritence and any Postgre-specific Physical Properties
- Views any Postgre-specific properties
- Columns any Postgre-specific properties
- Indexes
- Key Constraints
- Check Constraints
- Sequence
- Language
- Type - Enum
- Database
- Tablespace
- Function
- Trigger
- Schema and Users

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- Template support for many of the above object types

6.2.4 DB2 Support

Of course Tables, Views, Columns, and Indexes, etc... are supported, but we add support for many DB2-specific objects and properties as well.Here is a list of the DB2-specific features that are supported in ModelRight 4.0.

- Tables - Partitioning, Sub-Partitioning, LOB storage options, DB2-specific Physical Properties
- Views - any DB2-specific properties
- Materialized Views and their Physical Properties
- Columns - DB2-specific properties
- Indexes - Bitmap, and Function-based indexes, Local and Global Partitioning, DB2-specific Physical Properties
- Key Constraints - Unique Key Migration (Primary, Unique, and Foreign Key/Relations)
- LOB Storage
- Sequence
- Bufferpool
- Partition Group
- Security Policy
- Security Label
- Dimension
- Key Sequence
- Database
- Catalog
- Storage Group
- Alias
- Database Partition Group
- Procedure

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- Function
- Trigger
- Synonym
- Schema
- Tablespaces and their DB2-specific properties
- Template support for many of the above types

6.2.5 MySQL Support

Here is a partial list of the MySQL-specific objects and properties that are supported in ModelRight 4.0. ModelRight 4.0 can Reverse Engineer, Forward Engineer (Generate SQL DDL), and Compare these objects and properties with an existing database or other Model.

- Tables - Partitioning, Sub-Partitioning, MySQL-specific Physical Properties - like Engine, Row Format, Auto Increment, Key Block Size, etc...
- Columns - IDENTITY, Not for Replication, Enum and Set
- Views - MySQL-specific properties like: Security Type, Algorithm, Definer, etc...
- Indexes -MySQL-specific Physical Properties - like Full Text
- Key Constraints
- Collation
- Character Sets
- Engines
- Logfile Groups
- Database
- Tablespaces, Datafiles, and their MySQL-specific properties
- Template support for many of the above object types
- Partition Functions and S

6.2.6 ODBC

If you need to connect to a database that ModelRight does not explicitly support, then you can use ODBC to import it into ModelRight. ModelRight 4.0 will be able to reverse engineer,

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forward engineer, and synchronize with any ODBC compliant database. While ODBC does not have the deep support for physical details of a database, tables, columns, indexes, primary and foreign constraints will be supported (ODBC-driver dependent).

Of course Tables, Views, Columns, and Indexes, etc... are supported, but we add support for many Oracle-specific objects and properties as well.Here is a list of the Oracle-specific features that are supported in ModelRight 4.0.

- Tables
- Views - Forward Engineer only
- Columns
- Indexes
- Key Constraints (Primary, Unique, and Foreign Key/Relations)
- Check Constraints
- Template support for many of the above object types

6.3 Generate to Database/Forward Engineer

After you have created all of your tables, views, columns and other database objects and specified their properties, you are ready to create your database design in the database itself. ModelRight make this easy with its Generate to Database Wizard:

How to Generate (Forward Engineer) you database design to the database

1. Select in the Database Toolbar or **Database** > **Generate to Database** to start the Generate to Database Wizard.
2. The first step is to select the Schema Gen Options that you would like to use. Do you want to create or drop Tables? Views? Tablespaces, etc... Do you want to generate Comments? Quote Names? Constraint Names? All of these options and more are specified by a Schema Gen Option Set object. In this wizard page, you can select a pre-defined one and change its properties/options. Outside of this page, you can create and edit one simply by going to the Oracle Schema Gen Option Set section of the Model Explorer and create, edit, or delete one as you would any other object.

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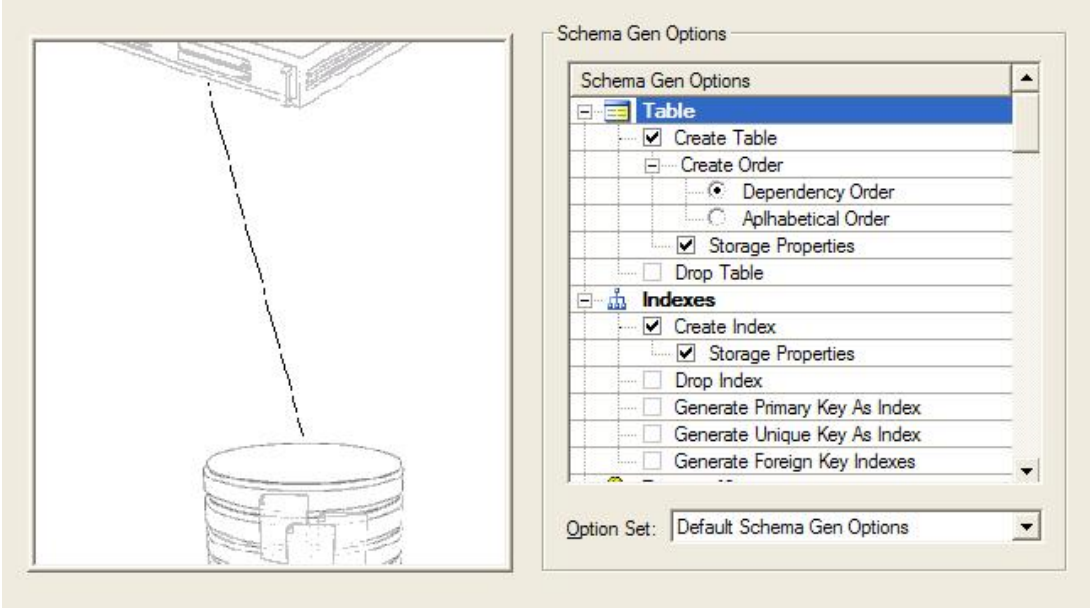
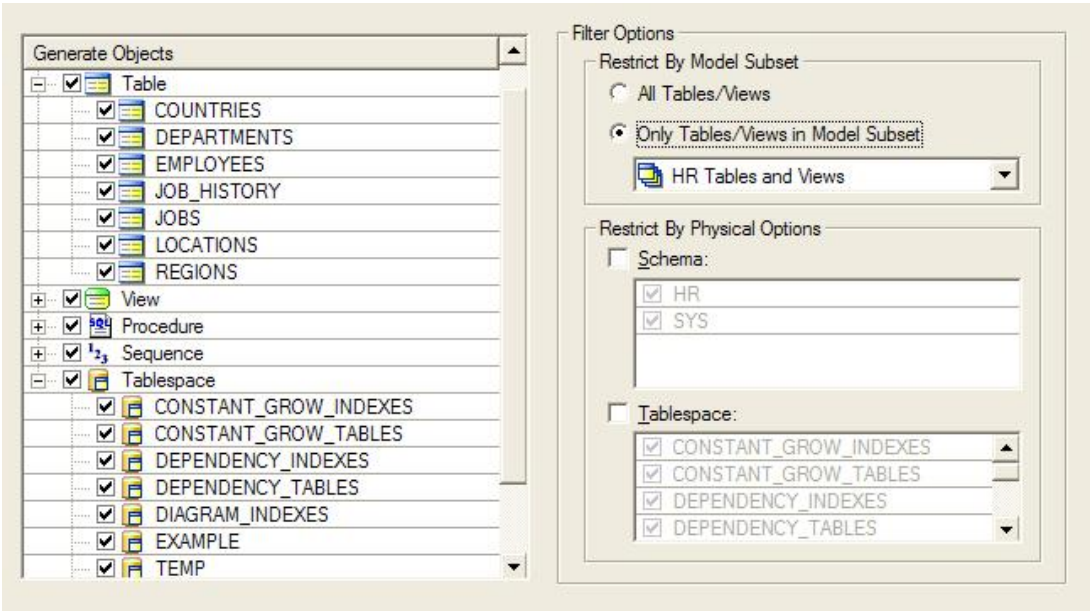


3. The second step is to specify the model objects that you want to generate. The **Restrict By Model Subset** option lets you specify whether you want to generate all the Tables/Views in your Model or only those that are in a Model Subset (the currently active Diagram's Model Subset is select by default). The **Restrict By Physical Options** options let you restrict the Tables and Views that are generated based on their Schema and/or Tablespace. The **Generate Objects** tree shows the result of selecting these options and lets you further specify the objects to generate.



4. The next page in this wizard is solely for your information. When the Next button is enabled, just click through to see your DDL.

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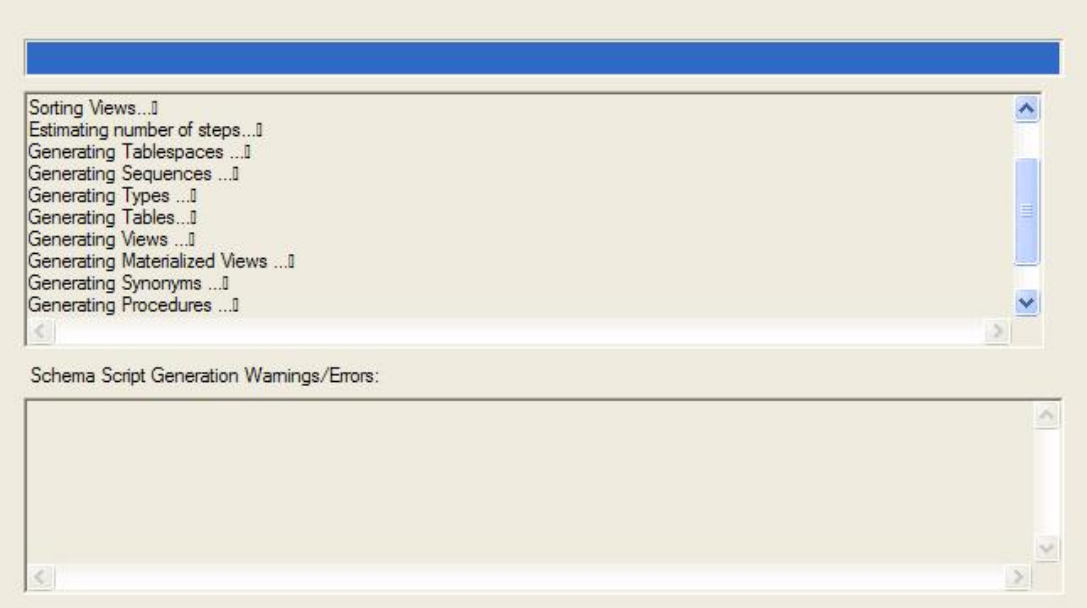

5. ModelRight orders the Tables and Views based on their dependencies and the selected Schema Gen Options and then evaluates the appropriate scripts to produce the SQL DDL - as illustrated below. Save it to file, copy/paste it to SQL/Plus, or generate it directly to the database.

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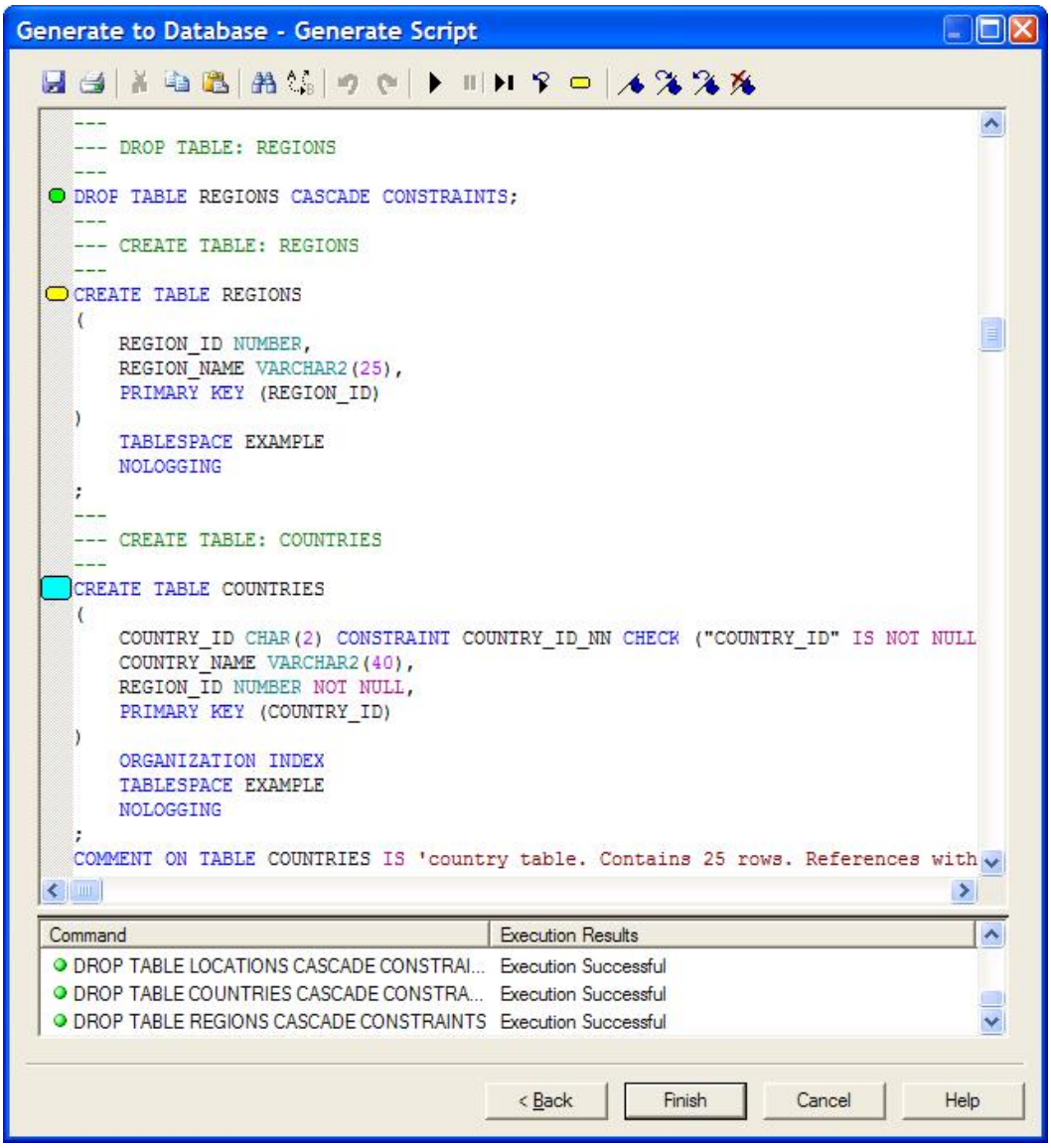

The "gutter" along the left of the script editor displays the status of the script execution. It displays a green dot ● to indicate the statement has executed successfully and a red dot ● to indicate the statement did not execute successfully. The results control at the bottom of the editor lists the statements that executed and the result. If you right-click on a statement in the editor, you can

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Toolbar

Run Script - evaluates the specified script type and displays the results.

Edit Script - lets you view and edit the VB script source code that is evaluated

Gutter Numbers

Cut, Copy, Paste

Find, Replace

Undo, Redo

Run - execute the SQL commands. If there isn't an active database connection, ModelRight will prompt you to login first.

Pause - pause the execution of the SQL commands.

Step Next - execute the next SQL command only.

Restart - restart executing the SQL commands - starting at the top.

Set Execution Line - set the execution point to the line where the caret is currently placed in the edit control. The symbol is displayed in the gutter to the left of the SQL edit control to show the next command that will be executed. You can set the execution line to any line in the control simply by first clicking on the text of the line, and then selecting this button.

Set Breakpoint - Click in the edit control on the line that you want to set a breakpoint on and click this button. A breakpoint will cause execution to pause when it gets to that line. The symbol is displayed in the gutter to show where breakpoints are currently set.

- scroll to the next breakpoint

- scroll to the previous breakpoint

- remove all breakpoints

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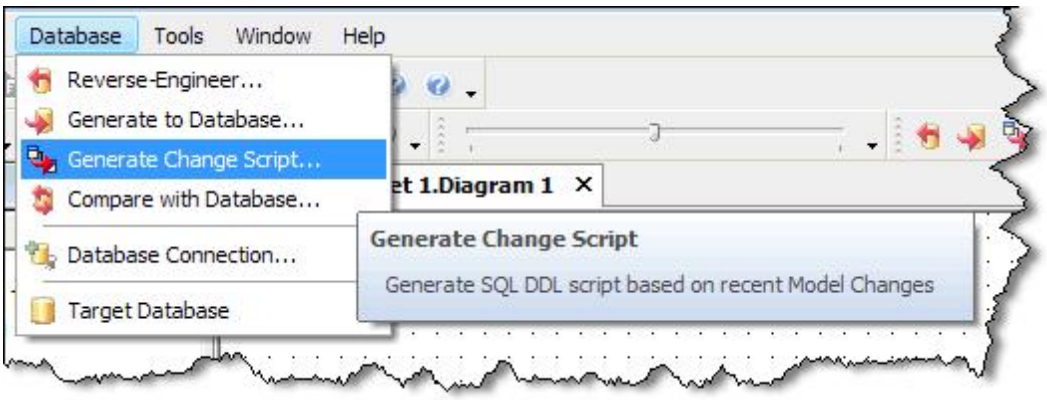
6.4 Generate Change Script

ModelRight 4.0 provides the ability to generate SQL DDL based on any Model changes. This can be very useful if you want to change the database to reflect the changes you recently made to your Model. If you know that your database hasn't changed and you just want to change it to reflect changes you just made in your Model, you can do so without having to go through the Compare with Database process/wizard.

How to Generate Model Changes

1. Select in the Database Toolbar or **Database** > **Generate Change Script** to start the Generate Changes Wizard.



2. The first step is to select the Schema Gen Options that you would like to use. You can generate the SQL DDL script for all the changes that you made this session, the last number of changes that you made, or specify the change that you want to start from.

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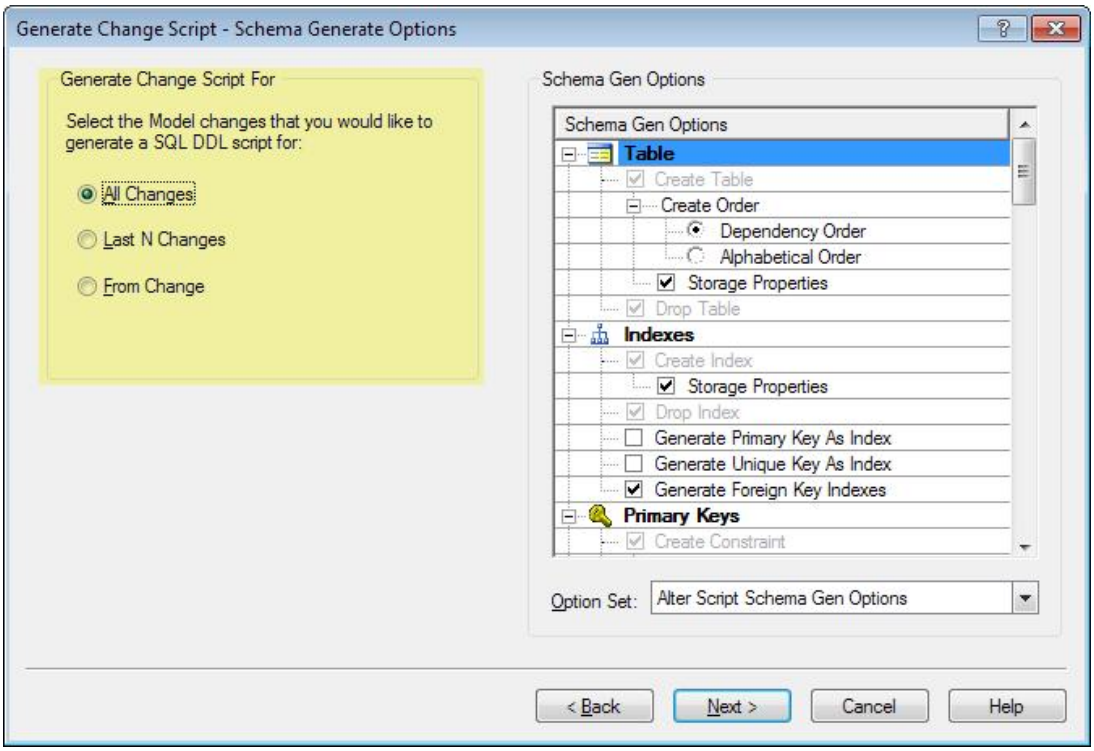
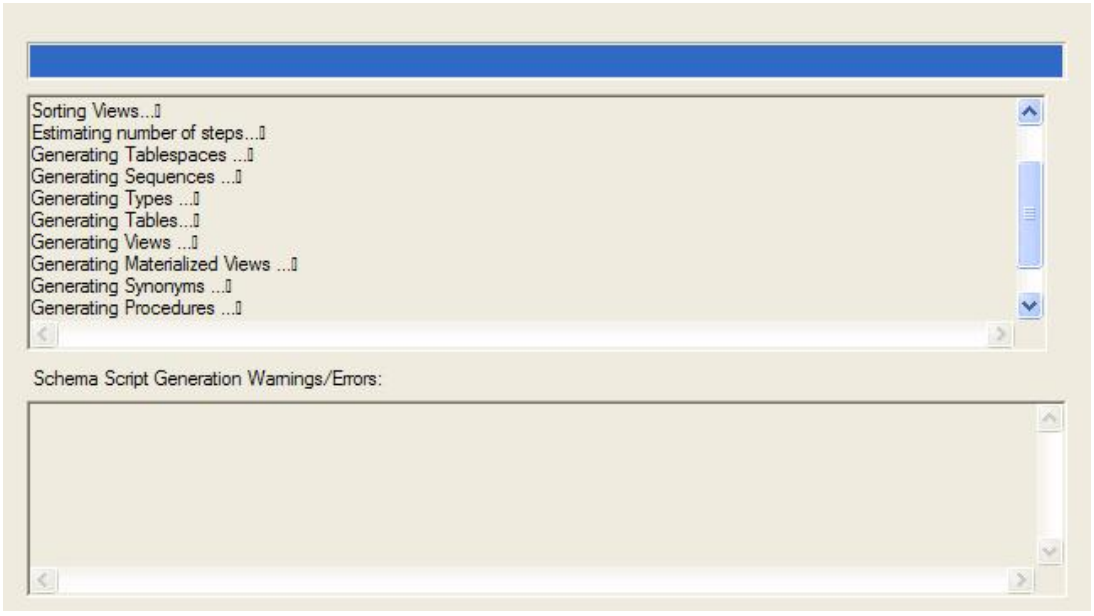


3. ModelRight then calculates the SQL DDL script that will effect the changes you want. This wizard page displays the progress of the script calculation. When the Next button is enabled, just click through to see your DDL.



4. Save it to file, copy/paste it to SQL/Plus, or generate it directly to the database.

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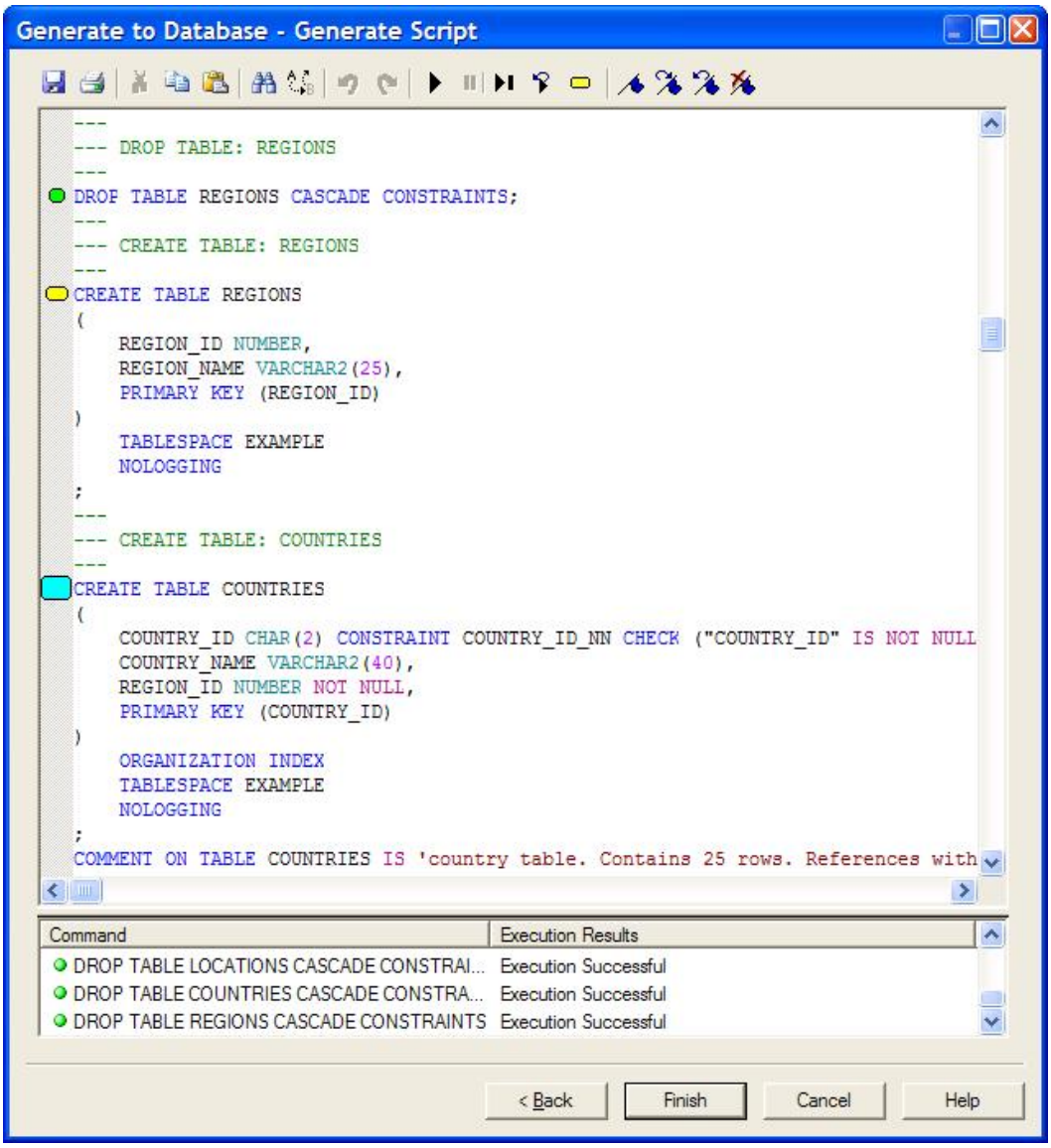

The "gutter" along the left of the script editor displays the status of the script execution. It displays a green dot ● to indicate the statement has executed successfully and a red dot ● to indicate the statement did not execute successfully. The results control at the bottom of the editor lists the statements that executed and the result. If you right-click on a statement in the editor, you can

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Toolbar

Run Script - evaluates the specified script type and displays the results.

Edit Script - lets you view and edit the VB script source code that is evaluated

Gutter Numbers

Cut, Copy, Paste

Find, Replace

Undo, Redo

Run - execute the SQL commands. If there isn't an active database connection, ModelRight will prompt you to login first.

Pause - pause the execution of the SQL commands.

Step Next - execute the next SQL command only.

Restart - restart executing the SQL commands - starting at the top.

Set Execution Line - set the execution point to the line where the caret is currently placed in the edit control. The symbol is displayed in the gutter to the left of the SQL edit control to show the next command that will be executed. You can set the execution line to any line in the control simply by first clicking on the text of the line, and then selecting this button.

Set Breakpoint - Click in the edit control on the line that you want to set a breakpoint on and click this button. A breakpoint will cause execution to pause when it gets to that line. The symbol is displayed in the gutter to show where breakpoints are currently set.

- scroll to the next breakpoint

- scroll to the previous breakpoint

- remove all breakpoints

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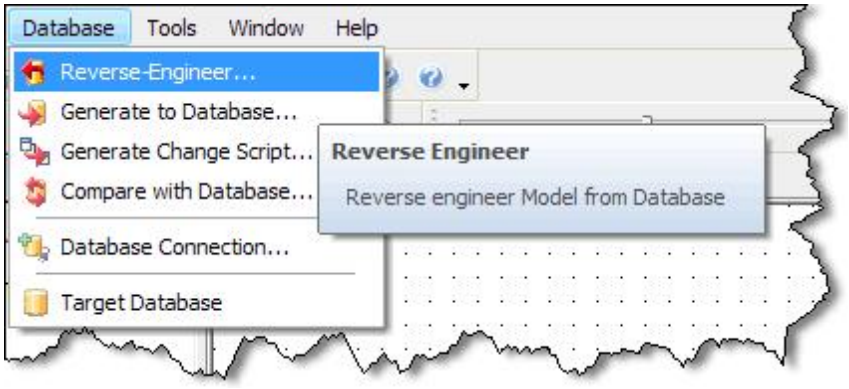
6.5 Reverse Engineering

Reverse Engineering refers to the process of reading information about your existing database from the system catalog and creating a new Model based on them. This is a good place to start using the product if you already have a database.

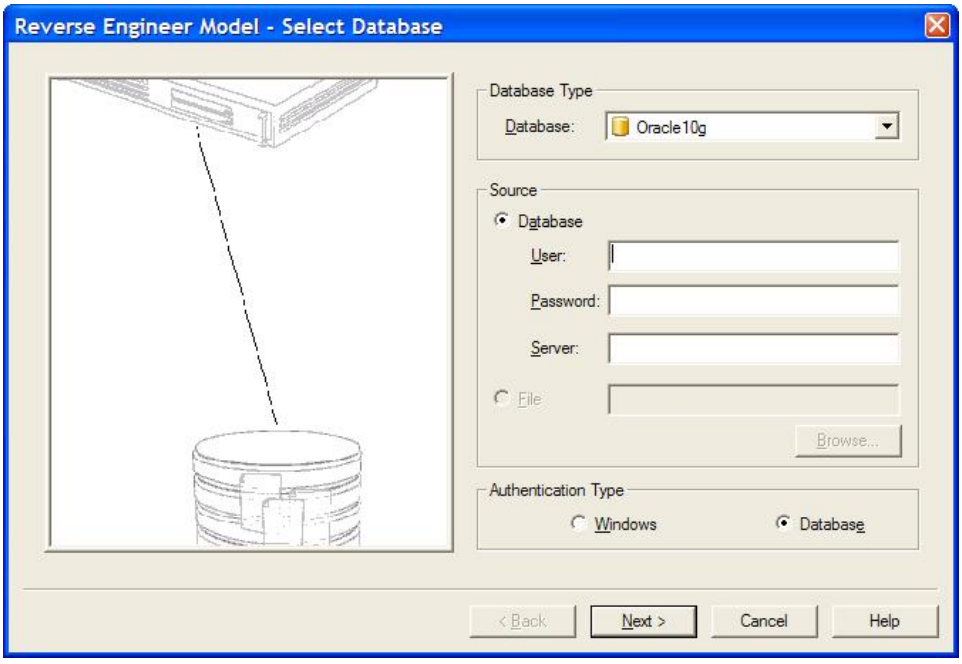
How to Reverse Engineer a new Model:

1. Select **Database** > **Reverse Engineer** from the menu, or select from the Database toolbar, or select

from the Database Tasks section of the Shortcut Toolbar to start the **Reverse Engineer** wizard. If you have a Model open, ModelRight will close it before starting the Reverse Engineer process. If the Model has any unsaved changes, ModelRight will prompt you to save them.



2.



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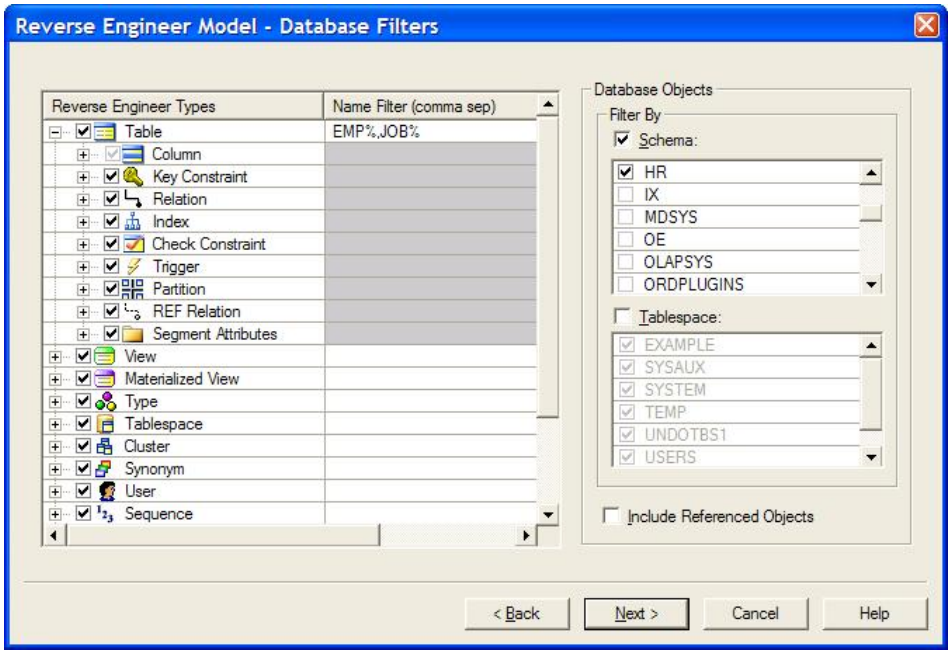
- Enter the connection information for the database that you want to Reverse Engineer, and click on **Next**. ModelRight uses native drivers so there is no need to fuss with ODBC drivers.

3. In the next page, define the database objects that you want to import.



You can filter the database objects that you import in a number of ways:

- You can filter any type of object by Name by entering a comma separated list of filters. These filters are used to form a LIKE conditions in the query statement that ModelRight uses to retrieve database objects. If a Name filter term starts with a "!", then a "NOT LIKE" condition will be used for that term. In the screenshot above, the Table Name filter specifies that only Tables starting with "EMP" or "JOB" will be imported.
- **Filter By Schema**: if you select this option, then only objects from the selected database Schemas will be imported.
- **Filter By Tablespace**: select this option if you want to import Table and Materialized Views based on the Tablespace they are in.
- **Include Referenced Objects**: if this option is selected, then if an object that is being imported references an object that is not selected for import, that referenced object will also be imported. i.e. if a Table you are importing has a Column that is a foreign key from another table that is not being imported, then that parent Table will also be imported - or if you chose not to import Tablespaces, and this option is selected, then ModelRight will automatically import Tablespaces that are used by the Tables that are imported.

4. The Instance Filter page lets you further specify the database objects that you want to

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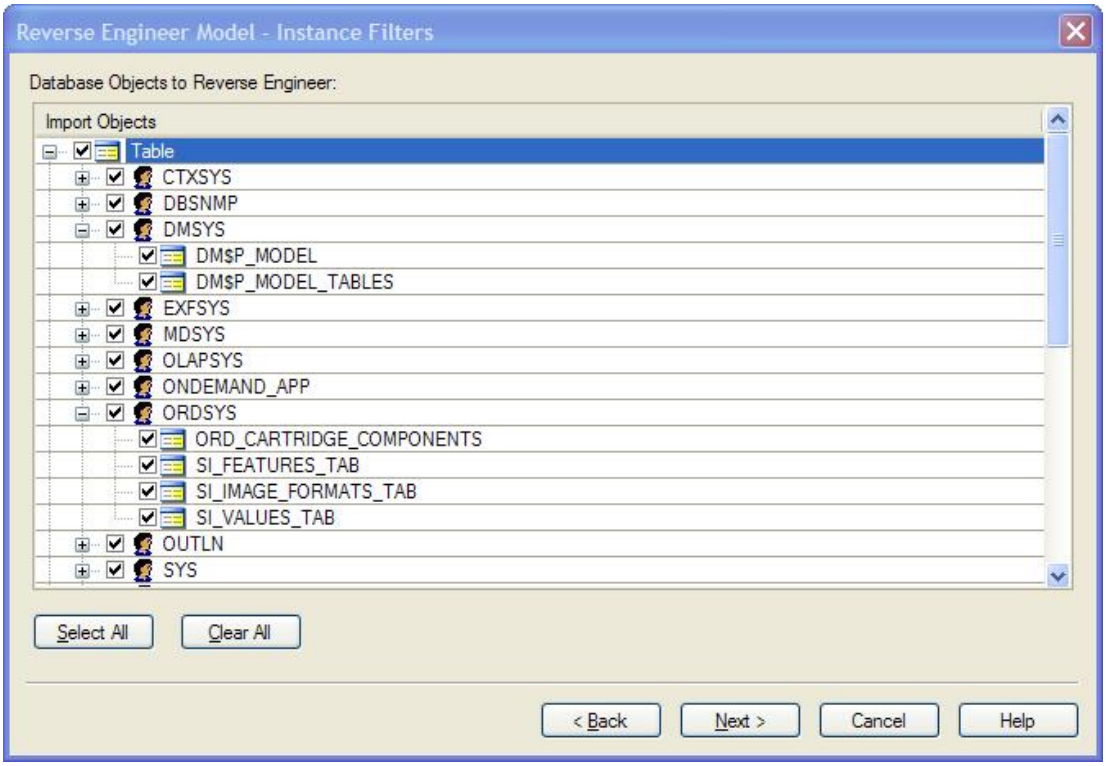
RE or Compare. The database objects that are displayed here are based on the filters that were specified on the previous wizard page:



If you Reverse Engineer into an existing Model, then a **Show Objects Already in Model** option is displayed to let you show or hide existing objects. This makes it easier for you to see what exists in the Database, but not in your Model.

5. The next screen displays just for your information - and to let you cancel the RE if you want. If you do hit Cancel, keep in mind that the first Cancel stops the RE, and the second Cancel will Cancel the dialog. Hitting Finish will Commit the RE process.

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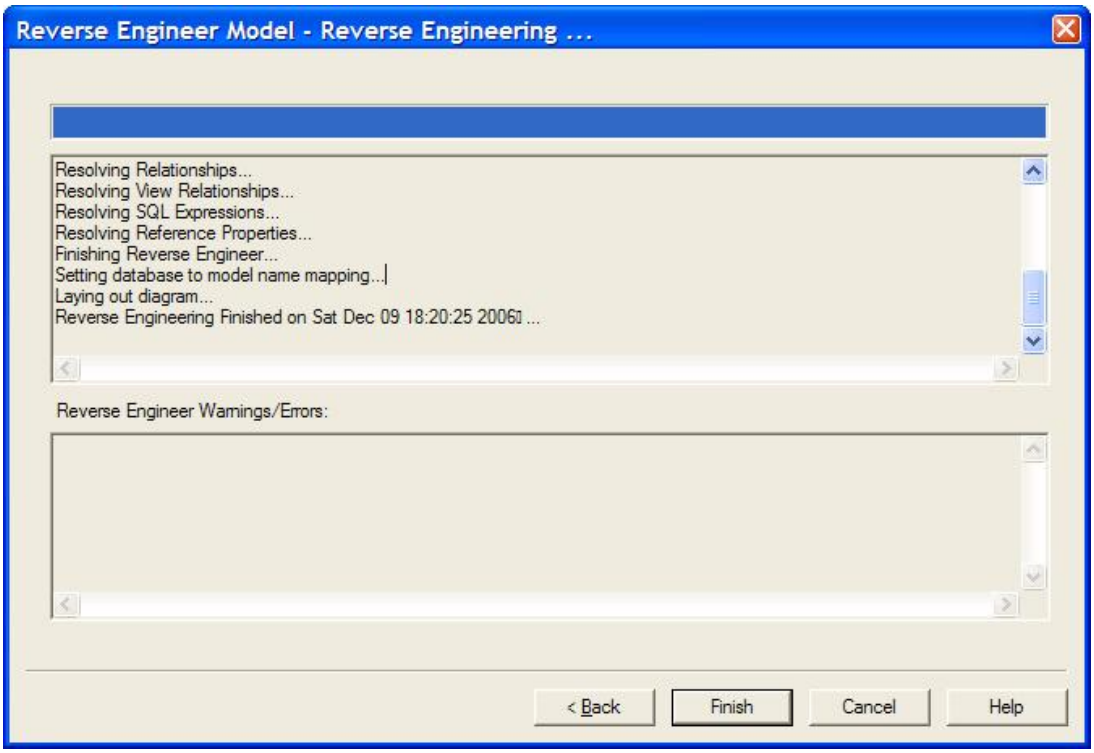

6. When the RE process has completed (either into a New Model or the existing Model), this dialog is displayed to give you a summary of what was imported. This dialog also contains options for inferring additional info and auto-layout of the Diagram. If your database already has key constraint and referential constraints already specified, then ModelRight will have already imported this information and you you will not need to select the infer option.

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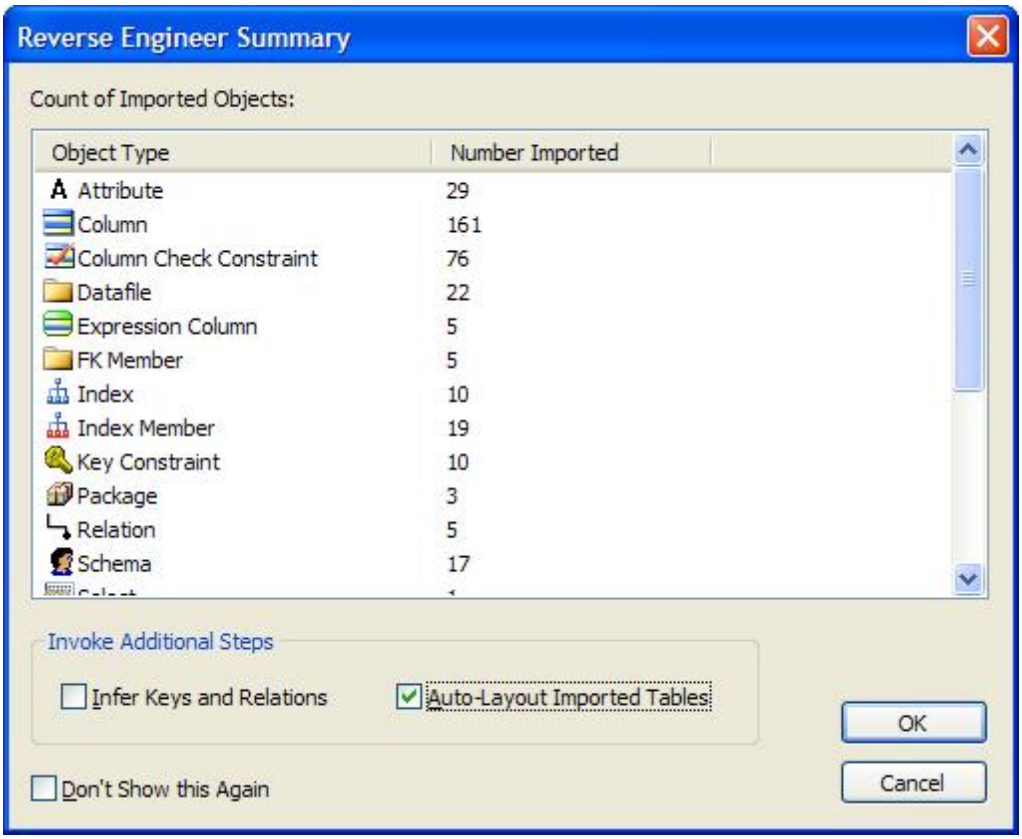
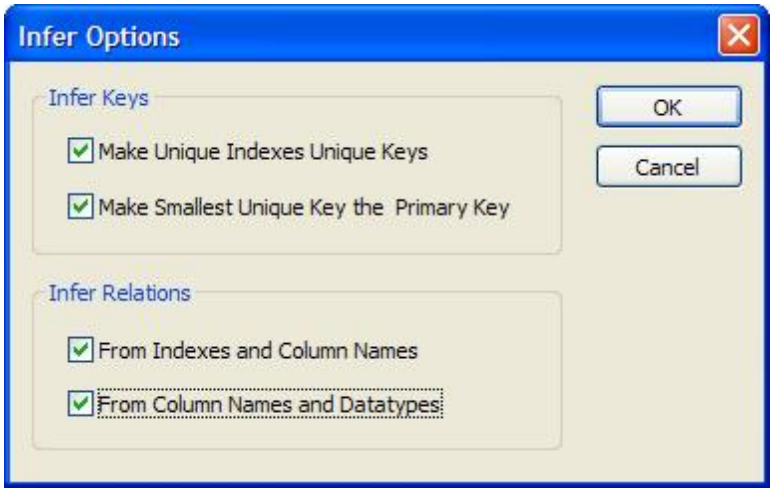


7. If you elected to Infer Keys and Relations, then this dialog is displayed to let you specify the constraint information that you want to automatically create.



- **Make Unique Indexes Unique Keys** - select this option if your database does not contain Unique Key Constraints, but does contain Unique Indexes that you want to associate with a Unique Constraint.
- **Make Smallest Unique Key the Primary Key** - if your database does not have Primary Keys or if you selected to infer Unique Keys, then select this option to infer a Primary Key. ModelRight will select the smallest Unique Key. If there is

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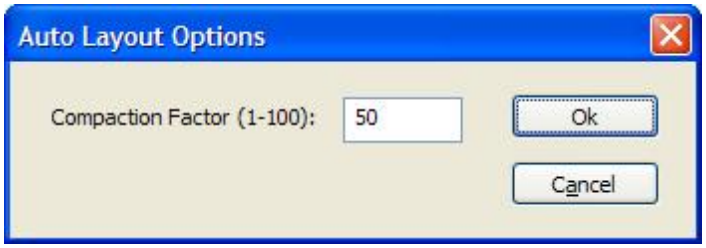
more than one, ModelRight 4.0 will select the one that who's first column has the most similarity to the Table name.

- **From Indexes and Column Names** - If an Index in a Child Table has Columns that match the names and datatypes of a Key Constraint in the Parent Table, then a relation is created.
- **From Column Names and Datatypes** - If a Child Table has Columns that match the names and datatypes of a Key Constraint in the Parent Table, then a relation is created.

If you Reverse Engineer into an the existing Model, then Infer will only be applied to the newly added Tables.

8. If you elected to Auto-Layout Imported Tables, then this dialog is displayed to let you specify the relative distance between Tables. The Compaction Factor must be a number between 1 and 100. The time that Auto-Layout and Diagram display of your new Model takes depends on how large your new Model is and how many relations it contains.



If you Reverse Engineer into an existing Model, then only the newly imported Tables will be used. At the end of the layout they will be auto-selected so that you can move them as a group.

6.6 Reverse Engineer into Model

"Reverse Engineering" refers to the process of reading information about your existing database from the system catalog and creating a new Model based on them.

"Reverse Engineer into Model" allows you to add objects from the database to an existing model. You can also do this with the Database Compare feature, however, in some cases it is easier and quicker to use this feature: i.e. if you know that you want to add all tables from a certain Schema or Tablespace en masse. This feature works for "top-level" objects like

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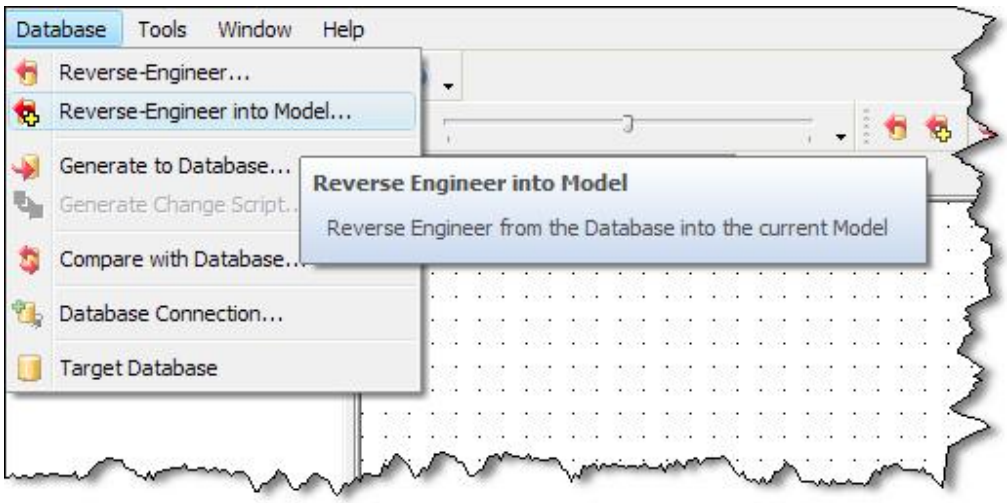
Tables, Views, Types, Tablespaces, etc.. If you want to add a sub-object, like a Column or Index, you will still need to use Database Compare.

Reverse Engineer into Model will reverse engineer relationships (i.e., referential constraints) between the new tables and the exiting tables. However in some cases, Database Compare still needs to be run to import other properties that link the new and old objects.

Reverse Engineer into Model will not reverse engineer objects that are already in the model.

How to Reverse Engineer into Model:

Select **Database** > **Reverse Engineer into Model** from the menu, or select from the Database toolbar, to start the **Reverse Engineer into Model** wizard.



See Reverse Engineer for a description of the wizard pages.

6.7 Compare with Database

ModelRight can compare your Model with the database to show differences between the two. You can export differences from the Model to the database (via an ALTER script) to make the database like the Model, or you could import differences to make the Model more like the database. The Compare with Database wizard is used for both purposes:

How to Compare your Model with the Database:

1. Select **Database** > **Compare with Database** from the menu, or select from the Database toolbar, or select

from the Database Tasks section of the Shortcut Toolbar to start the **Compare with Database** wizard.

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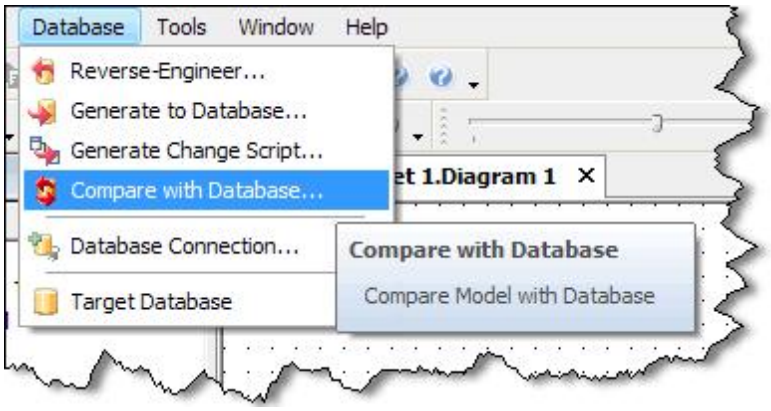
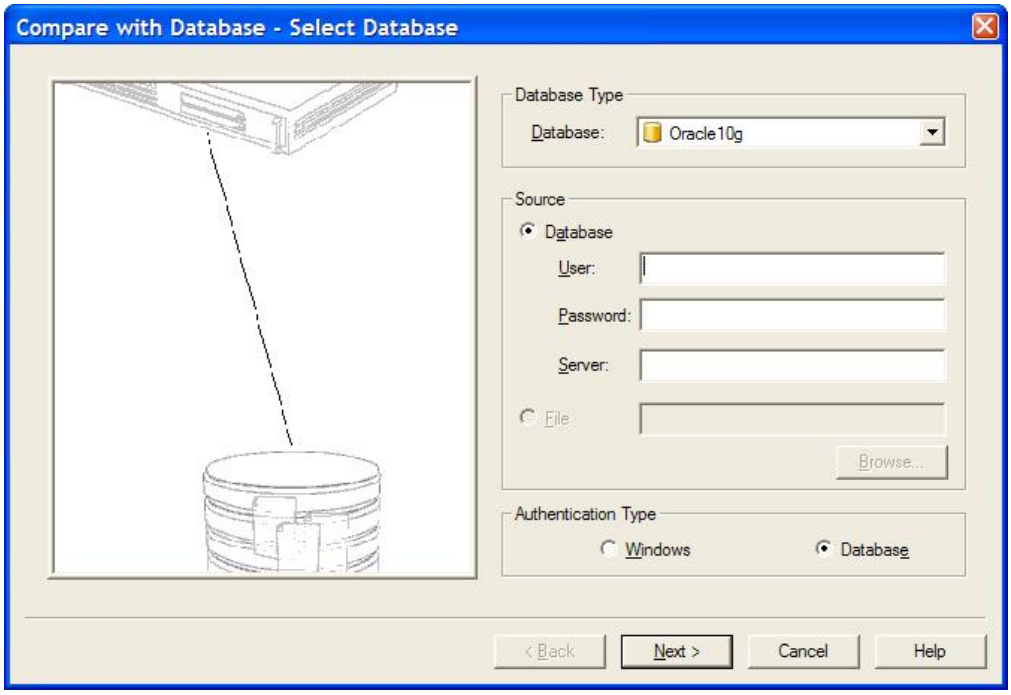


2. Connect to the database that you want to compare with:



- Enter the connection information for the database that you want to compare with, and click on **Next**. ModelRight uses native drivers so there is no need to fuss with ODBC drivers.

3. In the next screen you define the database objects that you want to compare your Model with:

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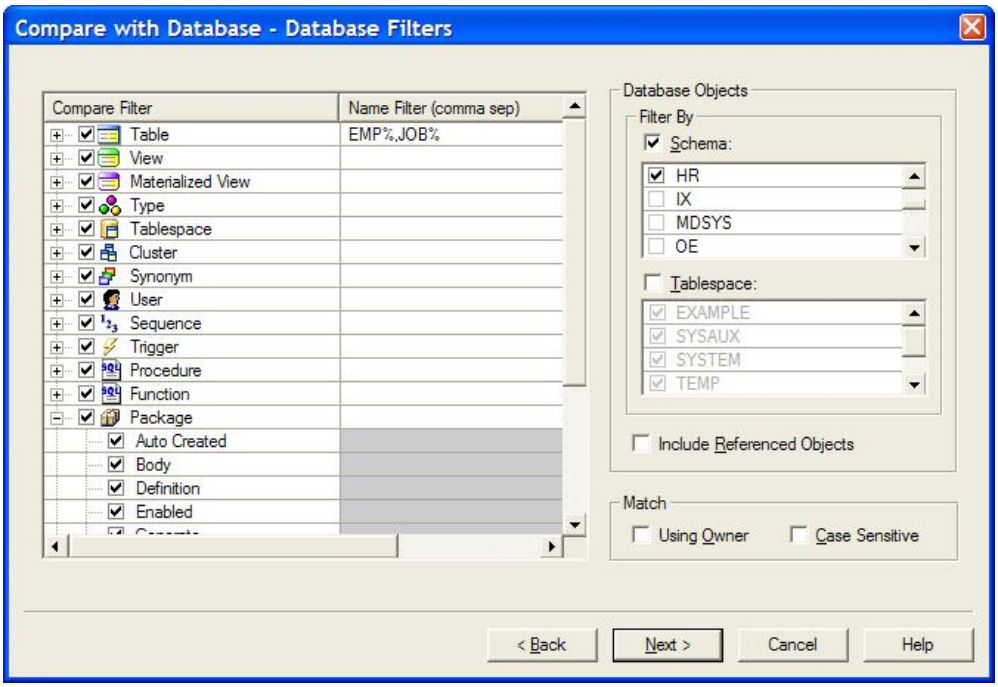

- **Compare Filter and Name Filter** - You can select which type of objects you want to compare by toggling the options in the Compare Filter tree. You can filter any type of object by Name by entering a comma separated list of filters in the Compare Filter tree control (you need to click twice, slowly in the Name Filter section). These filters are used to form a LIKE condition in the query that ModelRight uses to retrieve database objects. If a Name filter term starts with a "!", then a "NOT LIKE" condition will be used for that term. In the screenshot above, the Table Name filter specifies that only Tables starting with "EMP" or "JOB" will be compared. You can also expand any type of object in the Compare Filter tree control and un-select any type of child object or property that you do not want to compare.
- **Filter By Schema** - if you select this option, then only objects from the selected database Schemas will be imported to compare with.
- **Filter By Tablespace** - select this option if you want to compare Table and Materialized Views based on the Tablespace they are in.
- **Include Referenced Objects**: if this option is selected, then if an object that is being imported references an object that is not selected for import, that referenced object will also be imported. i.e. if a Table you are importing has a Column that is a foreign key from another table that is not being imported, then that parent Table will also be imported - or if you chose not to import Tablespaces, and this option is selected, then ModelRight will automatically import Tablespaces that are used by the Tables that are imported.
- **Match Using Owner** - after ModelRight loads Tables (Views, etc.) from the database, it needs to match up Tables in the Model with the Tables in the database. If this option is selected, then the Table owners must match as well as the Table names before ModelRight will match the Tables.

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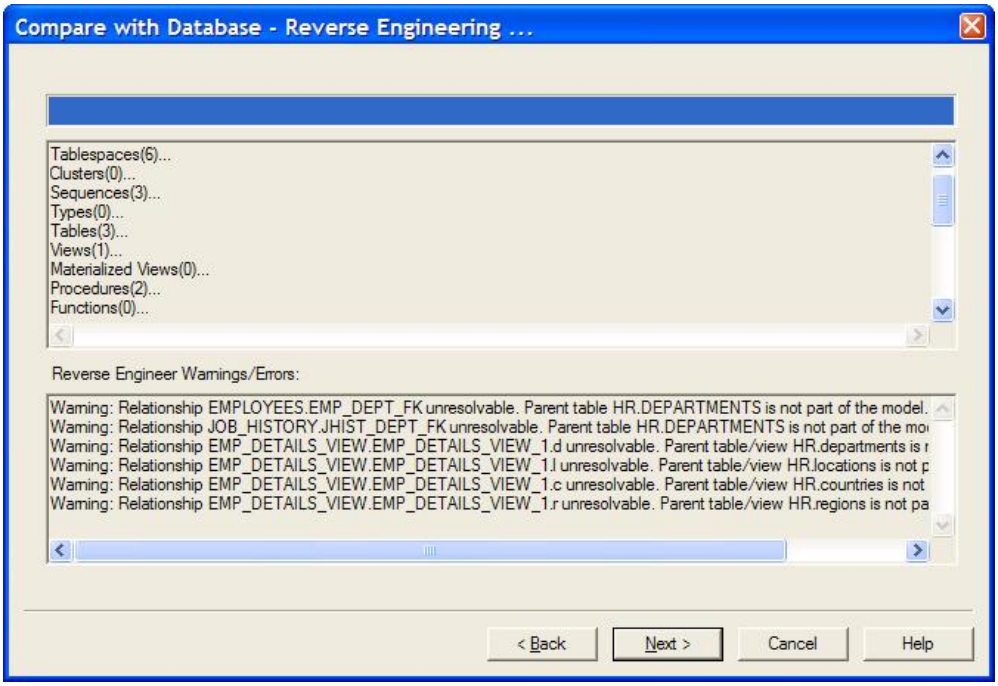
- **Match Case Sensitive** - if selected, then the case of the Names of objects must match before ModelRight will match the objects.

4. Once you have specified what database objects that you want to compare your Model with, ModelRight must retrieve information about those objects from the database. This page of the wizard is displayed just so you can monitor the progress of this process and Cancel at any time.


Compare with Database - Reverse Engineering ...
Tablespaces(6)...
Clusters(0)...
Sequences(3)...
Types(0)...
Tables(3)...
Views(1)...
Materialized Views(0)...
Procedures(2)...
Functions(0)...
Reverse Engineer Warnings/Errors:
Warning: Relationship EMPLOYEES.EMP_DEPT_FK unresolvable. Parent table HR.DEPARTMENTS is not part of the model.
Warning: Relationship JOB_HISTORY.JHIST_DEPT_FK unresolvable. Parent table HR.DEPARTMENTS is not part of the mo
Warning: Relationship EMP_DETAILS_VIEW.EMP_DETAILS_VIEW_1.d unresolvable. Parent table/view HR.departments is
Warning: Relationship EMP_DETAILS_VIEW.EMP_DETAILS_VIEW_1.l unresolvable. Parent table/view HR.locations is not p
Warning: Relationship EMP_DETAILS_VIEW.EMP_DETAILS_VIEW_1.c unresolvable. Parent table/view HR.countries is not
Warning: Relationship EMP_DETAILS_VIEW.EMP_DETAILS_VIEW_1.r unresolvable. Parent table/view HR.regions is not pa
< Back
Next >
Cancel
Help

5. This wizard page shows the differences between your Model and the database objects that you have specified in the previous wizard pages.

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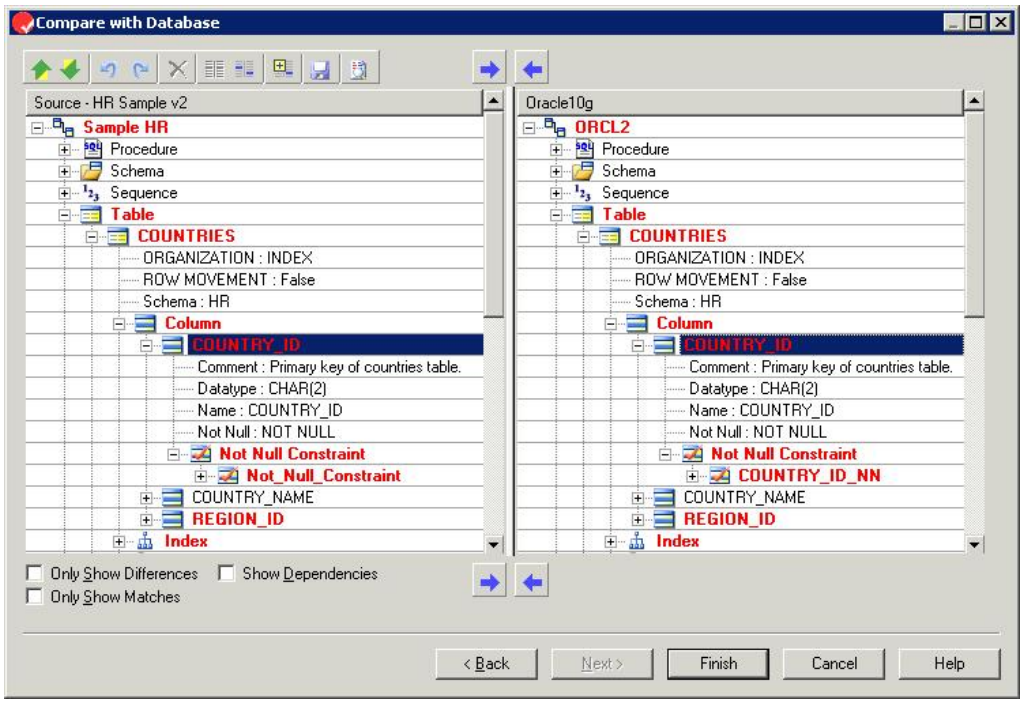

Toolbar Buttons

- export or import a difference. Use the import button to import a database object(s) or property into your Model. If you import an object/property from the database into your Model, the action is performed immediately and the comparison trees will be updated immediately with the result(s). Of course you can use the Undo/ Redo toolbar buttons that are on the page to undo/redo any changes.

Use the export button to export to the database any object or property that is in your Model. If you export an object/property, the action is performed immediately on the database Model. However, the ALTER script that will actually change the database isn't produced until you go to the Next page.

- go to the previous/next difference

- undo/redo changes that you made

- delete an unmatched object on the Model or database side

- manually match or unmatch objects. If ModelRight doesn't automatically match two objects that should be matched (probably because their names are different), then you can do so manually. Simply select one of the objects, hit the match toolbar button and select the other object that you want to match. You can also drag one of the unmatched items and drop it on the other one to match them. To unmatch two matched objects, select the matched items and hit the unmatch toolbar button .

- expand all child tree items

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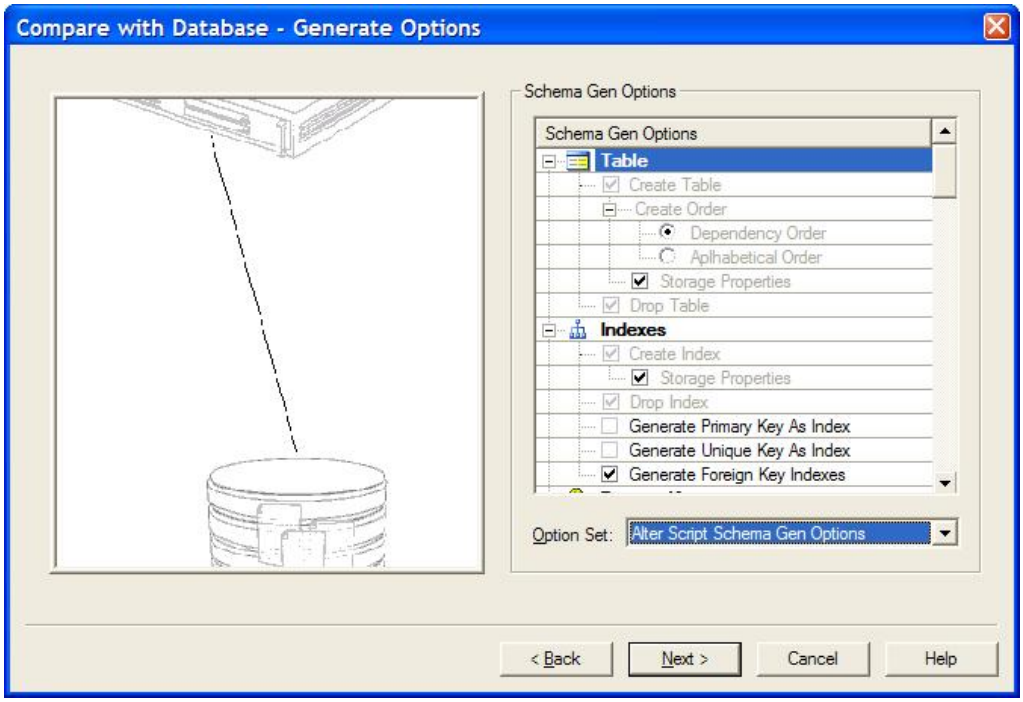
- save current compare tree to file as XML data and then display. When this button is selected, a dialog will appear to let you optionally enter a command to process the XML.

- show detailed differences of the currently selected items. Useful when the currently selected item is a multi-line property. When this button is selected, a dialog will appear to let you enter a shell command to run to show the differences between the selected items in detail. Enter the name of differencing application like WinDiff, Beyond Compare's application, etc...

Only Show Differences - if selected, then items that match and are equal on the database and model sides are not displayed.

Show Dependencies - shows all the referenced objects that an object depends on. In some cases, importing/exporting an object's differences will not fully resolve the a difference unless its referenced objects are first imported/exported. Selecting this option will cause unresolved dependencies to be displayed under objects in the tree so that you have a visual cue to help you determine what needs to be imported/ exported to resolve differences.

6. If you exported any changes in the previous step, then this page will be displayed next to let you specify Schema Gen options that might effect the ALTER script that will be produced in the next step.



Notice that the built-in Alter Script Schema Gen Options object has been automatically selected in the Option Set combo box.

7. This page displays the ALTER script that will implement the changes to the database that you previously specified.

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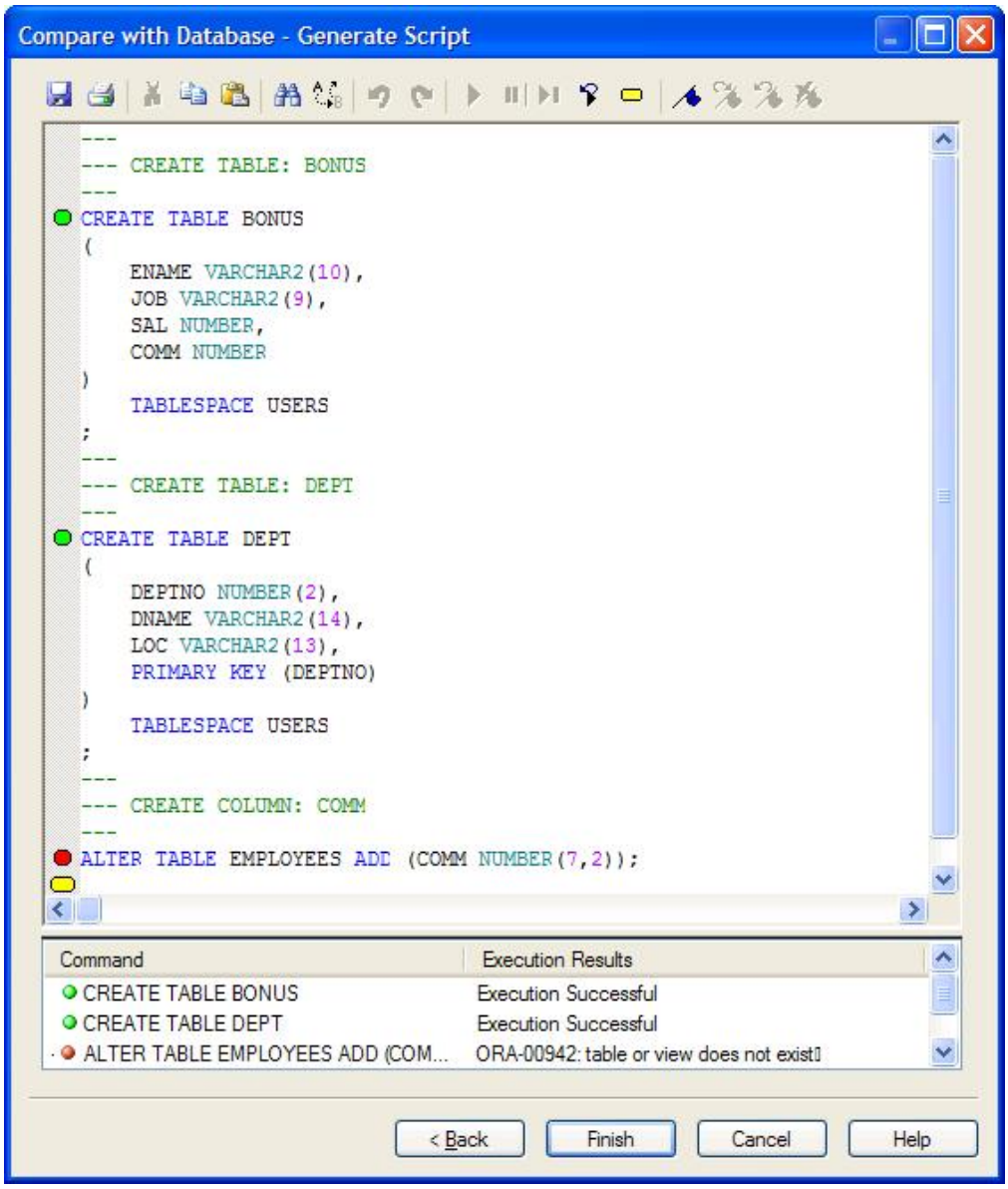

ModelRight evaluates an object's Alter Script property to produce the ALTER script. You can view and change this script to customize how the ALTER is produced. See the Scripting section of this document. You can generate the ALTER script directly to the database, save it to file or copy/paste it to SQL/Plus to make the changes to your database.

6.8 Converting Between Databases

When you change a Model's Target Database property, ModelRight will:

1) perform internal processing to transform objects and properties that can be preserved

2) convert datatypes of objects (usually Columns)

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3) delete any objects that are not represented in the new target database

4) swap in new Scripts to do Forward Engineering in the new target database

6.8.1 Datatype Conversion

When a new target database is selected, one of the steps that ModelRight takes is to convert the datatypes (if needed). The ***Convert Datatype*** Script is used to accomplish this. Its code looks something like:

```
    Select Case PrevDatabase ' what was the previous database type
        Case "MySQL 5.0", "MySQL 5.1"
            Select Case CurDatatypeName ' what was the name of the previous
datatype
                Case "TINYINT", "BOOL", "BOOLEAN", "SMALLINT"
                    NewDatatype = "SMALLINT"  ' specify the new datatype
name
                .
                .
                .
                Case Else
                    ' dont change it - let the datatype get deleted while
still being used.
                    ' the app will let you know by issueing a warning -
and inherit a default value
                    NewDatatype = ""
            End Select
        Case Else
            Document.Write("Unknown Previous Database")
            Exit Sub
    End Select
    If NewDatatype <> "" Then
        Obj.SetDatatype(NewDatatype)  ' call SetDatatype to change the
current objects datatype
    End If
    Document.Write("Ok")  ' return Ok, or something else to flag an error
```

The advantage of this approach is that the Script could contain any sort of coding logic that you might want to use to determine the new datatype. You could look at what the current object is that is having its datatype changed. You could look at the length of the datatype and use that to determine the new datatype. etc...

If you are converting from Oracle to another type of database, any Tables or Columns that use an Object Type will be converted to have the Object Type's Attributes represented as ordinary Columns.

As with any ModelRight Script, you can use the existing one, or change it for an individual object, the entire model, or all models. See Scripting for more details.

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Part

7 Property Pages

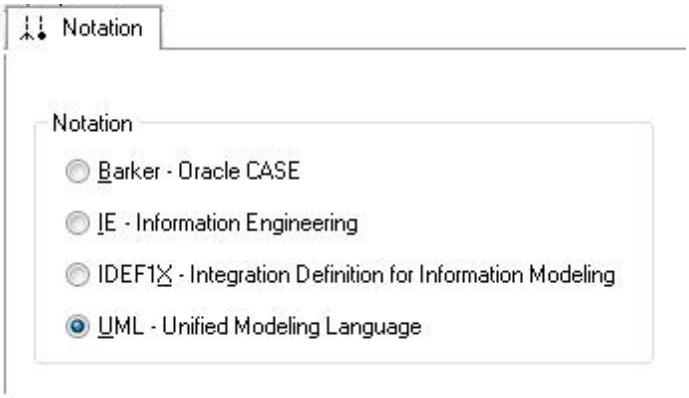
Property Pages are the tabs that appear in the Property Browser when an object is selected. Some of the more important, common, or non-trivial Property Pages are described in this section.

7.1 Common Property Pages

Some of the more common property pages are described in this section:

7.1.1 Notation

The Model/Notation tab lets you select which data modeling notation you want to use in your Model.



The Model Notation page

The following screenshots illustrate each of the Notation options:

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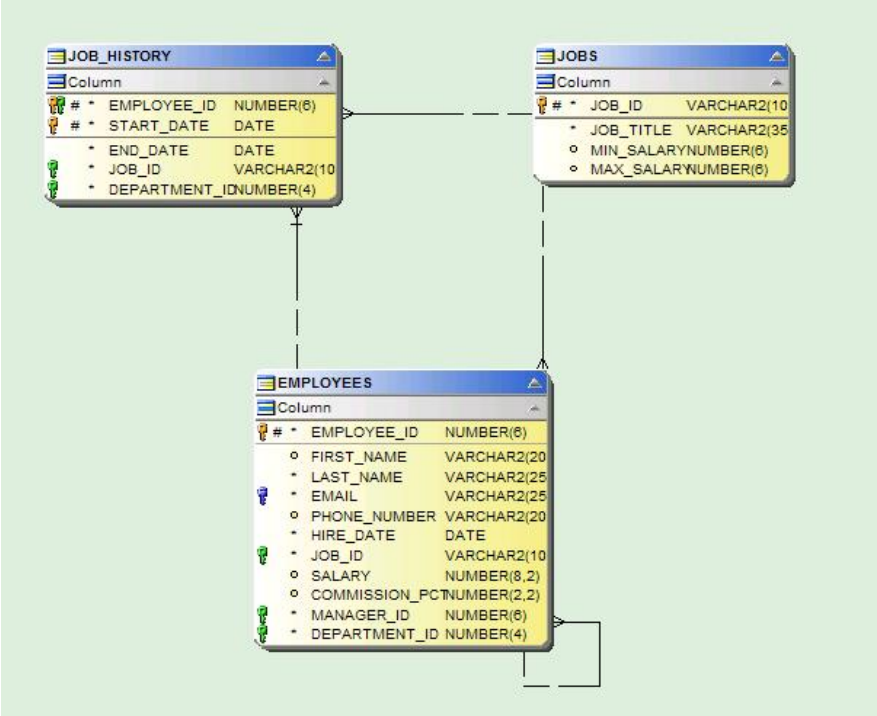
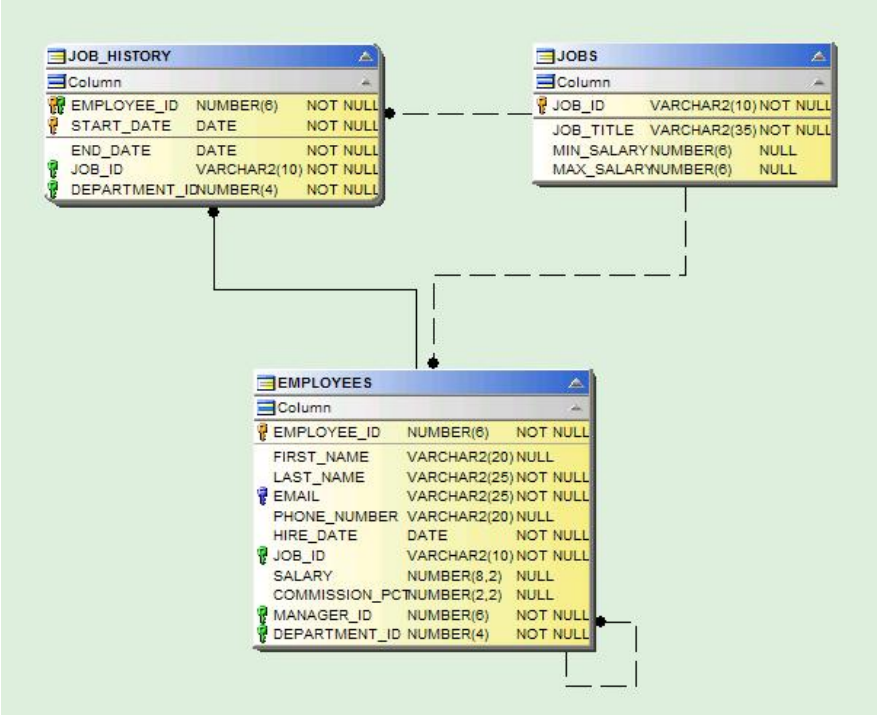


A Diagram using Barker Notation



A Diagram using IDEF1X Notation

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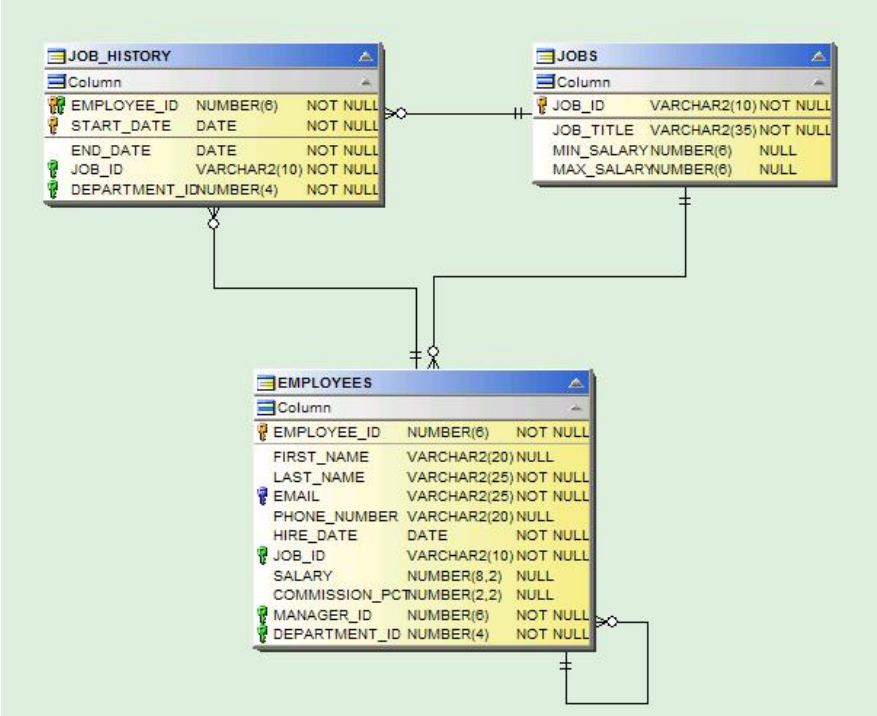
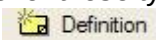


A Diagram using IE Notation

7.1.2 Comment & Definition Property Page

The comment is for descriptive text that is generated to the database. This tab is only made available for those types of objects that can generate a comment to the database. You can use the 

tab to enter descriptive text for any type of object.

7.1.3 Notes Property Page

A Notes property page was add so that you can annotate the issues, reminders, or other types of notes associated with an object. A Note can be entered using formatted text - with options for Font, Color, Style, Size, Bullets, Alignment, etc...

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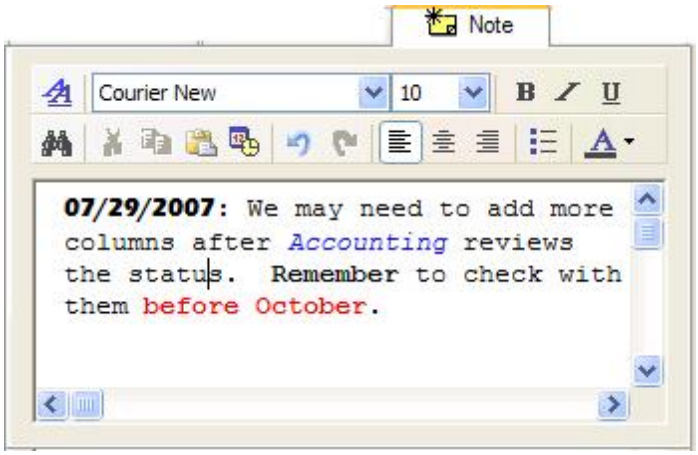
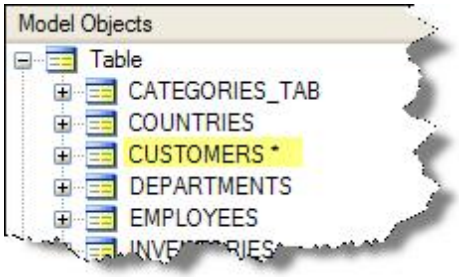

Note
Courier New
10
B I U
07/29/2007: We may need to add more columns after Accounting reviews the status. Remember to check with them before October.

The Notes property page

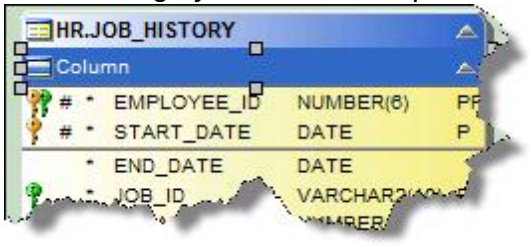
When an object has a Note, an asterisk (*) appears after its name in the Explorers. An option to toggle the display of this reminder was added to the Model Explorer context menu (though it applies to all Explorers) and in the Tools/Options/Model Explorer dialog.



Illustrates the asterisk that is placed after the name of an object that has a Note in the Explorer.

7.1.4 Category Property Page

If the user selects a category in the Model Explorer or on



the Diagram , then the Property Browser will display its Category editor. This Property Page is designed to let you quickly add new, delete or rename objects of the type that you selected.

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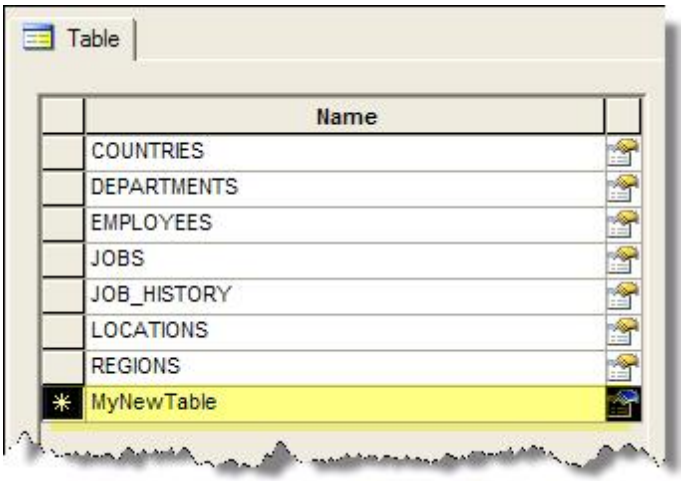
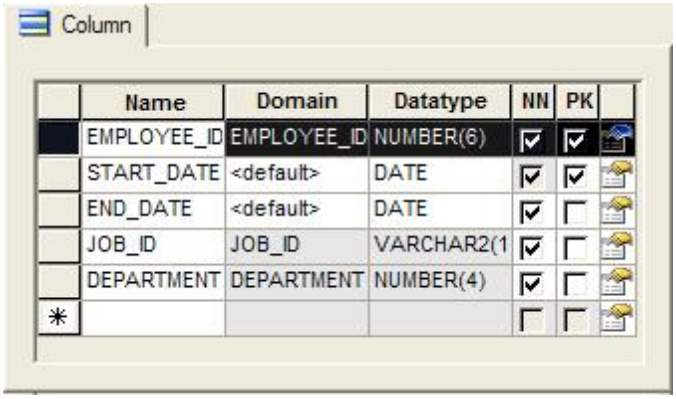


The Category editor. In this case the Table category was selected. The last line of its control is always reserved for quickly adding new objects.



The Column Category editor has more controls to let you enter commonly used properties of Columns.

You can always go to the last line in the category editor (highlighted in the screenshot above), enter the name of a new object and hit Enter to create a new object. Selecting a part of a name will start editing of the name.

You can also use the following keys to navigate the Category editor's grid control:

Delete - deletes the object that currently has the focus - if its allowed

Up Arrow - moves the current focus up - wraps when it gets to the top

Down Arrow - move the current focus down - wraps to the top when it gets to the bottom

Tab - moves the focus to the next field. Shift+Tab moves the focus to the previous field.

Enter - if editing a name, then it will commit the edit changes, if not editing the name, then it will cause the current selection to go to the selected object if the properties icon is currently selected.

Esc - if editing a name, then it will cancel the edit changes

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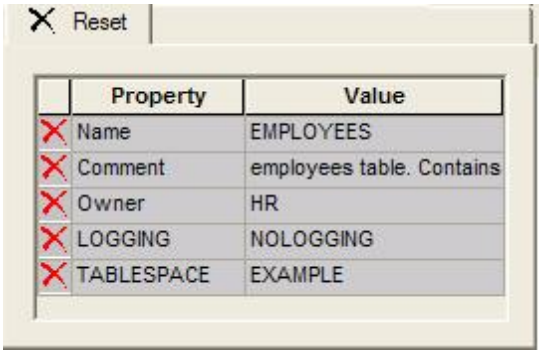
7.1.5 Reset Property Page

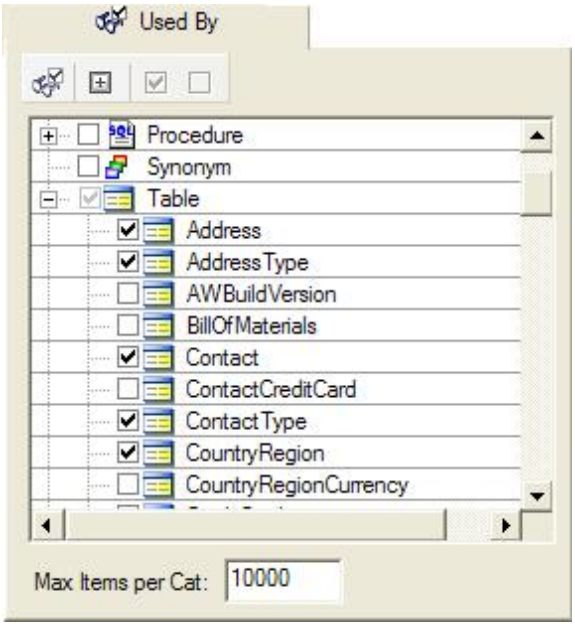
The Reset Property Page is made available for all objects and it allows you to delete a property that has been defined on an object. It only lists those properties that have been defined "locally" and can be deleted.



You delete the property by clicking on the ✕.

7.1.6 Used By Property Page

Reusable objects like storage objects (Tablespaces, Filegroups), Schemas, Types, User-defined Properties, Templates, etc... have a Used By Property Page. This page displays and lets you edit which other Model objects use the selected object. To have a Model object use the selected object, simply check it. You can also jump to the displayed items by double-clicking on them.



This page shows all the objects (Tables, Synonyms, etc...) that are using the currently selected object (in this case a Schema). You can check and uncheck any of the entries to have them use (or not) the selected Schema.

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Used By Toolbar

- toggle to display selected items only

- expand the tree to show all objects

- make the current object use the selected objects

- make the current object not use the selected objects

Max Items Control

Some categories, like Columns, might have thousands of potential entries. Use this control to specify a limit to the number of entries that ModelRight 4.0 should display in a category.

7.1.7 Links Property Page

The Links Property tab is displayed for all objects and lists other objects that are in some way associated with the selected object. Most of the displayed objects are automatically linked via child of, referenced by, references, inherits from, or is inherited by associations. In the case of tables, columns, and relations you may also see FK (a.k.a. parent/child) associations.

You can define your own "shortcut links" between the selected object and any other model object, a file, or a website URL. Keyboard accelerators (Ctrl+1, Ctrl+2, ...Ctrl+8) can then be used to quickly navigate to these user-defined shortcut links and take you to the link's target. Ctrl+9 is reserved as a shortcut link to the first parent object and Ctrl+0 is reserved as a shortcut to the first Child object. This is automatically defined for relationships - which have only one parent and child - and table and columns (which may have more than one - so the shortcut link will take you to the first one).

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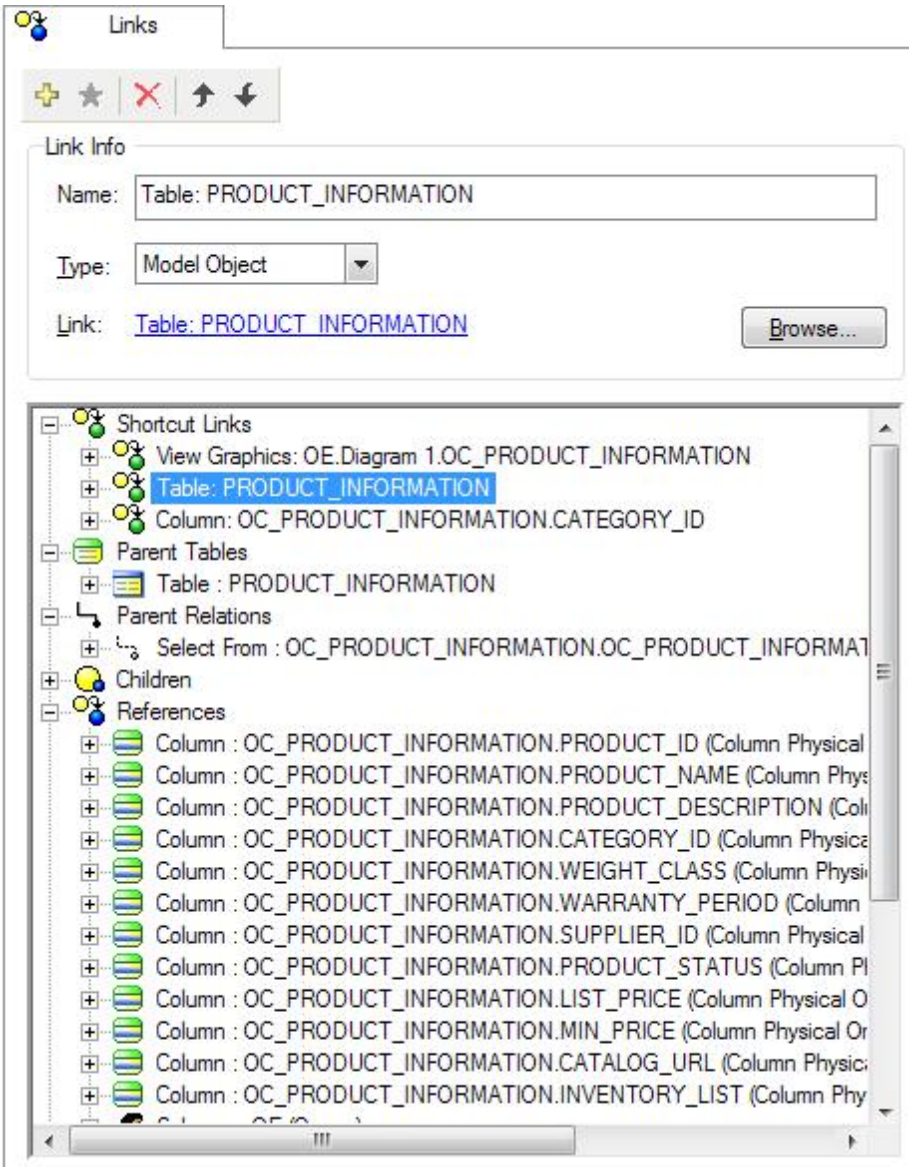

To create a link to an object in another Diagram, link to the Model/Model Subset/Diagram/ Graphic object in that Diagram.

A link can also be specified as a property of an Image and Text Graphic. If a link is specified on an Image or Text Graphic, then it acts as a hyperlink - and when you click on it, it will take you to the target of the link.

The Links Toolbar

- create a new link

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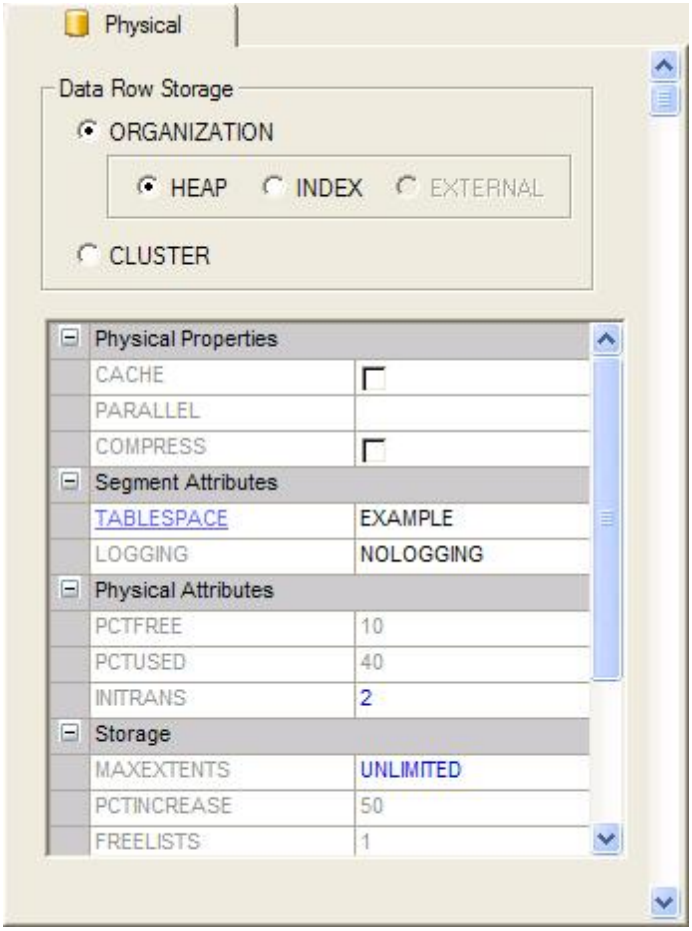
- add the selected object as a link

- delete the selected user-defined link

- move the selected user-defined link up or down in order

7.1.8 Physical Property Page

Objects, like Tables, Index, and Tablespaces, that have extensive physical properties are provided with a Physical tab.



An example of a Physical tab that uses a grid to edit physical properties (in this case for a Table).

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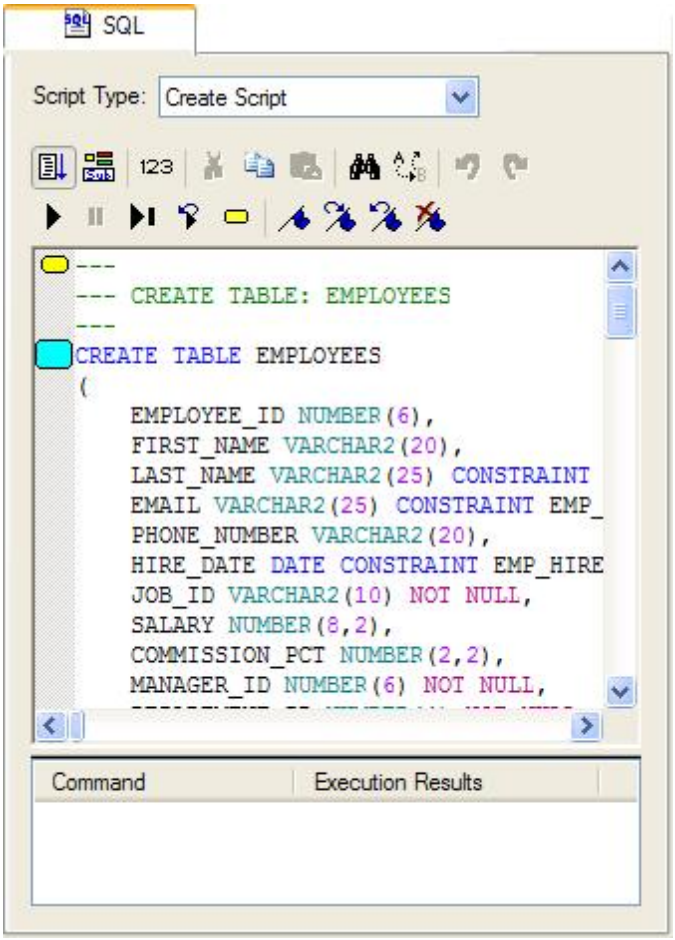
This tab uses a property/value grid to display and edit physical properties. The values in this grid are colored to indicate how the value of a property was derived:

- Black - the property's value has been defined "locally". i.e. the value has been set directly on the object and is not inherited from a Template
- Blue - the value for the property is inherited from a Template (like MAXEXTENTS above)
- Grey - the value is calculated or based on a built-in default value

7.1.9 SQL Property Page

The SQL Property Page is used to display the SQL that will be generated to the database. The SQL is created by evaluating a VB Script. See VB Scripts for more details.



SQL Property Page with the Run Script button selected

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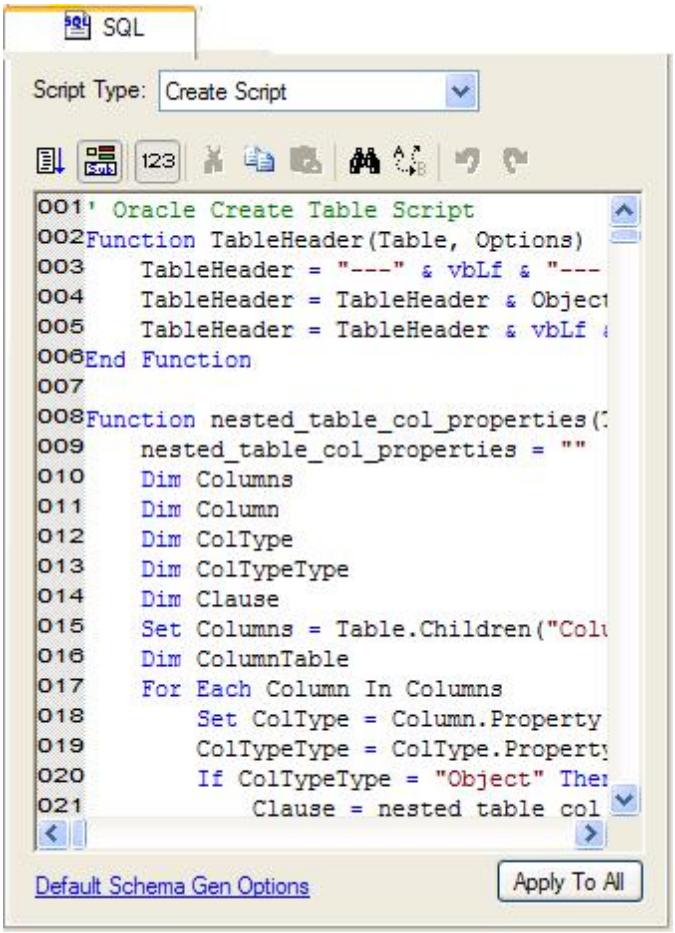
SQL
Script Type: Create Script
001' Oracle Create Table Script
002Function TableHeader(Table, Options)
003 TableHeader = "---" & vbLf & "---
004 TableHeader = TableHeader & Object
005 TableHeader = TableHeader & vbLf
006End Function
007
008Function nested_table_col_properties(
009 nested_table_col_properties = ""
010 Dim Columns
011 Dim Column
012 Dim ColType
013 Dim ColTypeType
014 Dim Clause
015 Set Columns = Table.Children("Colu
016 Dim ColumnTable
017 For Each Column In Columns
018 Set ColType = Column.Property
019 ColTypeType = ColType.Property
020 If ColTypeType = "Object" Then
021 Clause = nested table col
Default Schema Gen Options
Apply To All

SQL Property Page with the Edit Script selected

Script Type

An object can have many different kinds of Scripts. i.e. a Create Script, a Drop Script, and Alter Script, a Pre Script (to be evaluated and generated before the Create Script), a Post Script (to be evaluated and generated after the Create Script), etc... This control allows you to select which script property you want to view or edit.

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Toolbar

Run Script - evaluates the specified script type and displays the results.

Edit Script - lets you view and edit the VB script source code that is evaluated

Gutter Numbers

Cut, Copy, Paste

Find, Replace

Undo, Redo

SQL Execution Toolbar

Run - execute the SQL commands. If there isn't an active database connection, ModelRight will prompt you to login first.

Pause - pause the execution of the SQL commands.

Step Next - execute the next SQL command only.

Restart - restart executing the SQL commands - starting at the top.

Set Execution Line - set the execution point to the line where the caret is currently placed in the edit control. The symbol is displayed in the gutter to the left of the SQL edit control to show the next command that will be executed. You can set the execution line to any line in the control simply by first clicking on the text of the line, and then selecting this button.

Toggle Breakpoint - Click in the edit control on the line that you want to set a breakpoint on and then click this button. A breakpoint will cause execution to pause when it gets to that line. The symbol is displayed in the gutter to show where breakpoints are currently set.

- scroll to the next breakpoint

- scroll to the previous breakpoint

- remove all breakpoints

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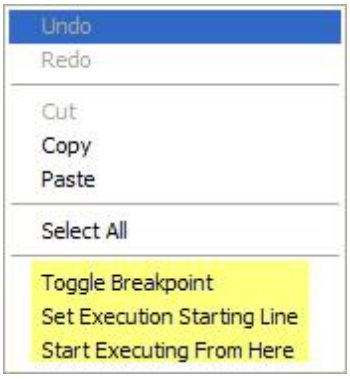
If you right-click in the SQL commands editor, the following menu will appear. You can Toggle Breakpoints, Set Execution Start, and Start Execution on the line you clicked on:



Apply To All

If you make changes to the VB Script, ModelRight creates a local value for the given script property. If you then decide that you want to use this VB Script for all objects (of the given type in the model), click the "Apply To All" button. This will removed the local value and set it on the corresponding Script object in the Script Explorer.This button becomes enabled only if you have changed the selected script property.

Default Schema Gen Options

The schema generation options affect the SQL that is generated. Click this link to go to the Default Schema Gen Options object to change the selected options. Just click the Navigate Back toolbar button to get back to this property page to see the results.

See also:

Scripting

7.1.10 Graphics Property Page

Any object that is displayed in a Diagram will have a Graphics Property Page when that object is selected and the Diagram is active. A Graphics object is used to represent the object within the Diagram. i.e. it holds display properties like font and color that are used to draw the object. Each object that is displayed in a Diagram has an associated Graphic object.

When the Diagram is active and you select the object, ModelRight automatically adds the corresponding Graphics object to the selection. That is why in the Property Browser you see the both the object's Property Pages as well as the Graphics Property Page (for the Graphics object). Similarly, when you select an object in the Model Explorer, ModelRight automatically adds its associated Graphics object from the active Diagram (if there is one) to the selection.

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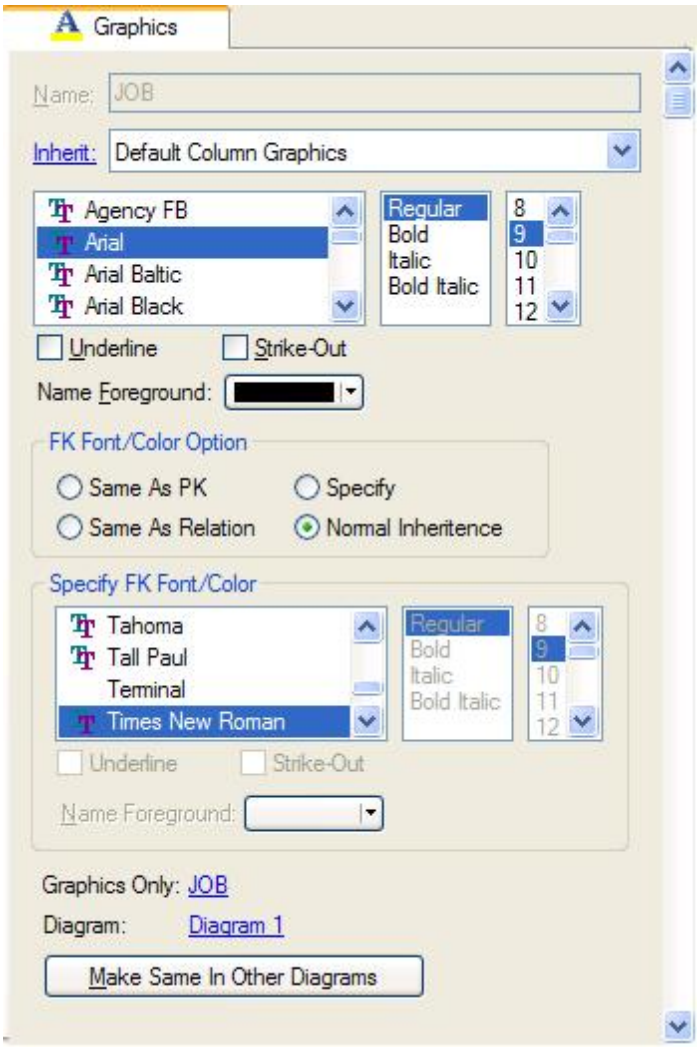

An example of a Graphics Property Page. In this case, its for a Column.

Common Controls

Inherit - select which Graphics Template you want the current Graphics object to inherit properties from.

Graphics Only - click the Graphics Only link to select just the Graphics object. You may need to do this to reset its properties.

Diagram - a link to the Diagram object that owns the Graphics object.

Make Same In Other Diagrams - copies the current Graphics properties to the corresponding Graphics objects in all the other Diagrams.

Image and Text Links

The Image and Text Pages also let you specify link properties. If these properties are

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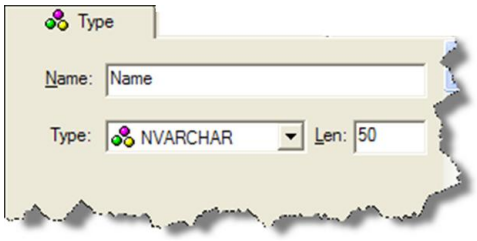
specified then, the Image or Text Graphic acts as a hyperlink. i.e. if you click on it, it will take you to the target of the link. A link target can be either a) another Model object b) a file, or c) a website URL.

7.1.11 Type Property Page

An Alias Type is a datatype that is defined in terms of a built-in datatype, but has a different name to convey more meaning. When you generate a Column that uses an Alias Type, the built-in datatype is substituted for the Alias Type. Alias Types allow you to define your Model's datatypes in more meaningful terms. You can use them to organize, re-use, and easily change the datatypes that your Columns use.



Alias Types are available for all databases. The Type dialog varies by database.

7.1.12 Independent Defaults

Independent Defaults allow you to define Default values in one place and re-use them throughout your Model (by your Model's Columns). When a Column that uses an Independent Default is generated to the database, the Independent Default's value is used as the DEFAULT value of the Column. Since Independent Defaults are defined in one place, they ensure consistency and correctness and make it easier to change Column Defaults throughout your Model.

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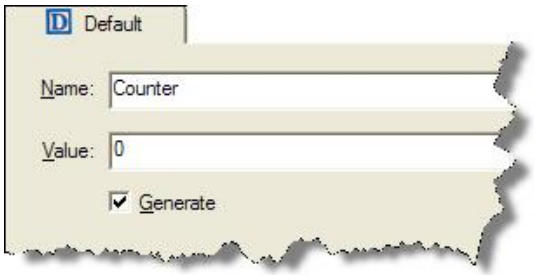
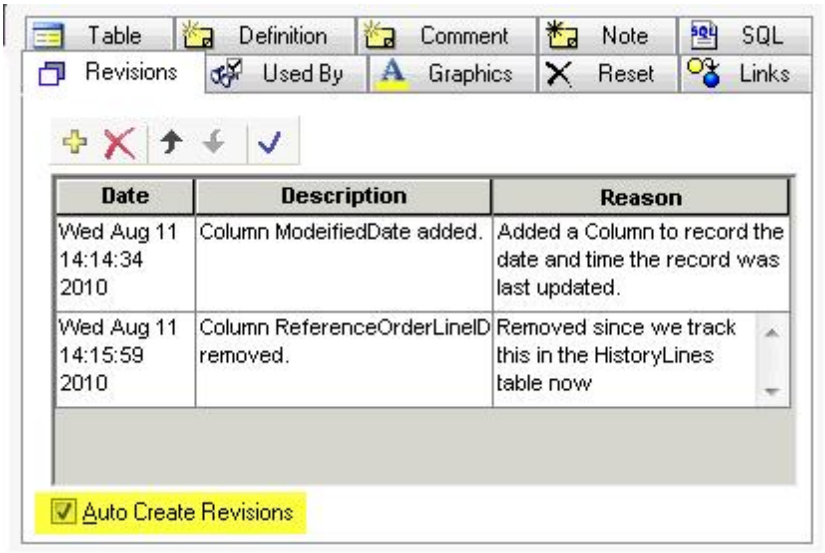


7.1.13 Revision History

ModelRight 4.0 has the capability to maintain a list of Revision notes on any object - to document the changes to the object over time. ModelRight 4.0 also provides the capability to automatically add a revision note whenever an object changes.



An example of the Revision page for a Table

7.2 Diagram Property Pages

A Model's Diagrams are displayed at the top of the Model Explorer. When you select one, the Property Browser will display the following tabs (among others):

- Diagram - general Diagram options
- Display - display options for the different types of objects that are displayed in a Diagram
- Category - how to delimit categories displayed within a Table or View
- Notation - select between Barker, IDEF1X and IE notations
- Grid - self-explanatory background grid options

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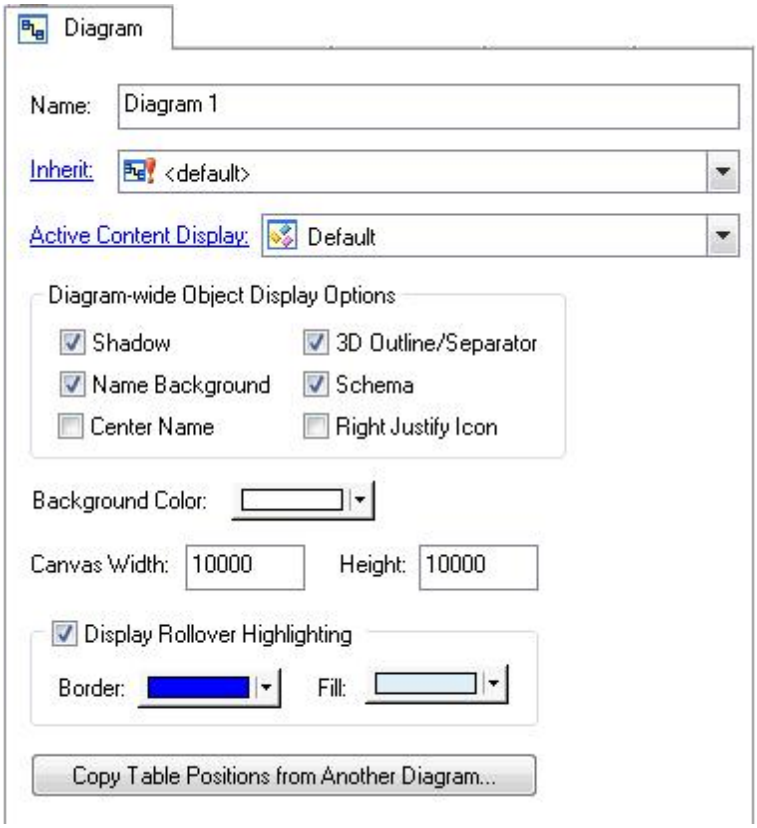
7.2.1 Diagram Property Page

The Diagram tab lets you edit some general properties of a Diagram. As usual, you can change the Name and Template of the selected object.



7.2.2 Relation Display Options

The Display Property Page shows the Relation Display Options when you select Relation in the Display Type control.

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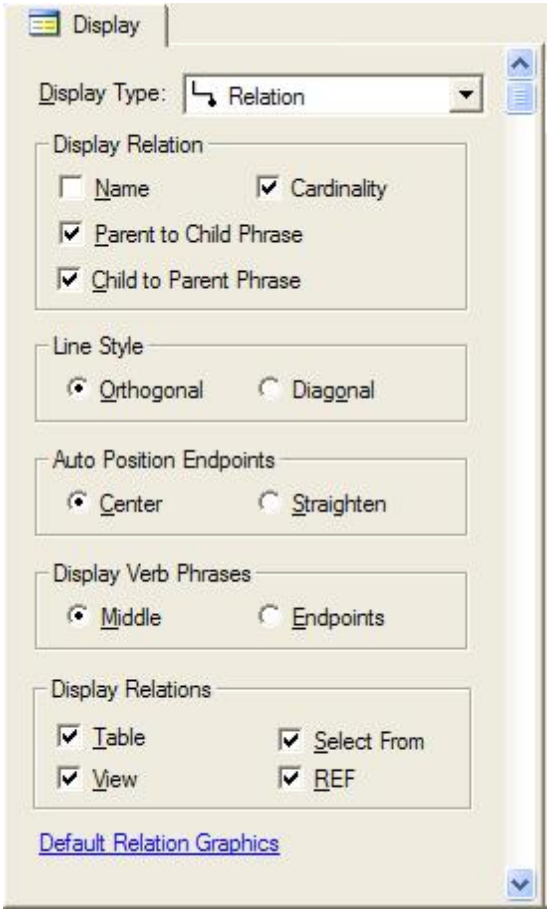

Display Type - the contents of this tab is based on the type of object that is selected in the Display Type control. You can switch between editing Table, View, Materialized View, and Relation display options.

Display Relation - lets you toggle the on-diagram display of various text items

Line Style - draw Relation lines either diagonally or orthogonally. If you change the Diagram's Notation this option is also updated to the default value for the Notation.

Auto Position Endpoints - determines where the default location of the Relation endpoints should be placed. A value of **center** will result in the Relations being clustered around the center of a Table's sides. A value of **straighten** will result in endpoints being placed in such a manner that a Relation line will be drawn as a straight horizontal or vertical line whenever possible.

Display Verb Phrases - display the Parent to Child and Child to Parent verb phrases either in the center of the Relation line or at the endpoints. If **middle** is selected then the Parent to Child Verb Phrase will be displayed above the Child to Parent in the middle of the Relation. If **endpoints** is selected, then the Parent to Child Verb Phrase will be displayed at the Relation's parent table endpoint and the Child to Parent Verb Phrase at the relation's child table.

Display Relations - lets you toggle the display of all Relations of a particular type within the Diagram. You can also toggle the display of a Relation on an individual basis using the

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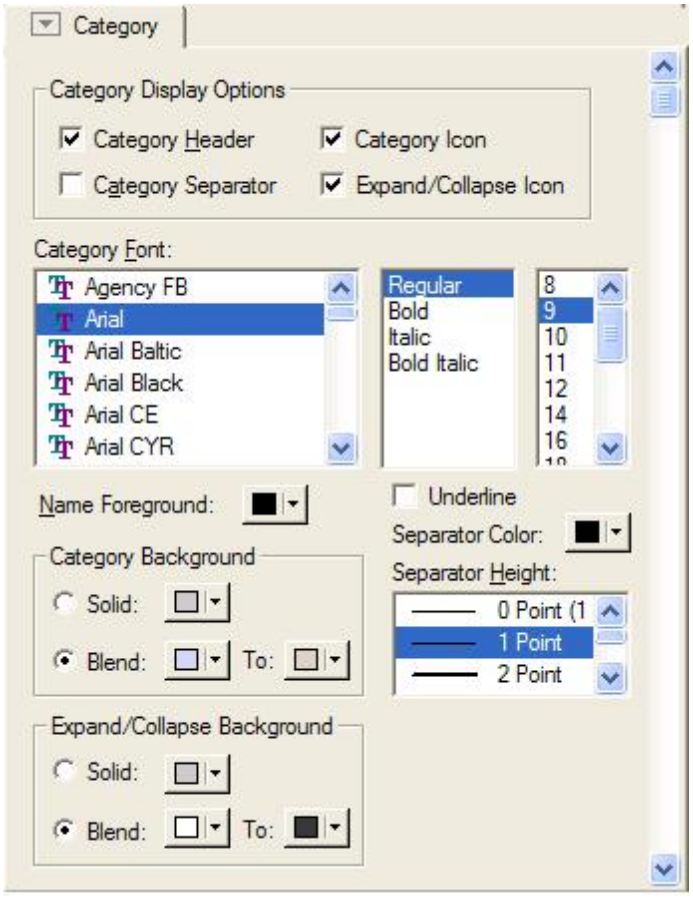
Relation Graphics Property Page.

Default Relation Graphics - Some properties of the a Relation are controlled by the Diagram. Others are controlled by the Relation Graphics objects - as described under Relation Display Options. This hyperlink is provided so that you can conveniently jump to the default Relation Graphics object - which can be used to set properties that affect the display of all Relations in all Diagrams,

7.2.3 Header

When viewing a Table (or View) in a Diagram, ModelRight lets you display not just Columns, but any type of object that a Table can own.

The options in this tab let you define how the delimiter between the different types of child objects (i.e. Categories) should be displayed. The options in this tab are self-explanatory and demonstrate themselves when clicked.



A Diagram's Category tab in the Property Browser

With the Category Header and Category Separator options, you can either have a "thick" Header with the name of the child object type or a narrow line Separator.

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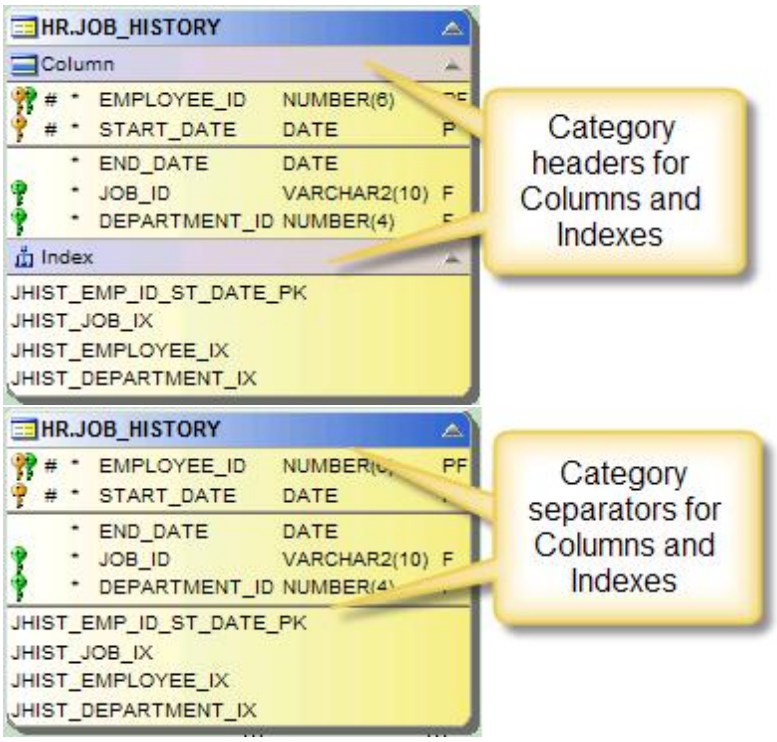

7.3 Table Property Pages

When you select a Table, the following Property Pages will appear in the Property Browser:

Table/General

Physical

Partition

Graphic

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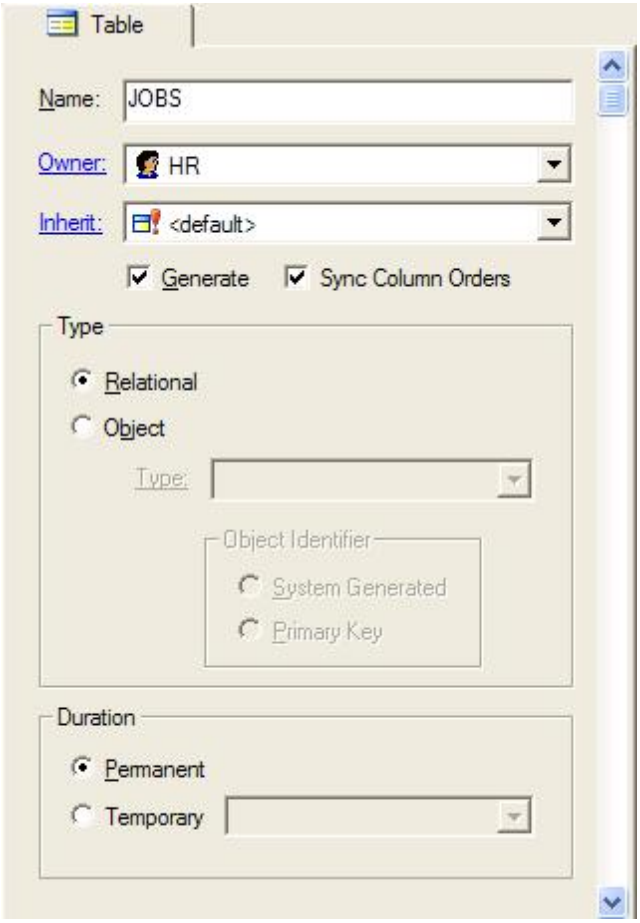
7.3.1 Table Property Page

The Table Property Page lets you edit the basic properties of a Table.



Name - change the Name of the selected Table

Owner - specify the Owner of the selected Table. Click on the Owner: link to jump to the selected Owner.

Inherit - specify the Table Template that the selected Table should inherit property values from. Use the Inherit: link to jump to the selected Template.

Generate - specify whether the selected Table should be generated to the database or not.

Sync Column Orders - ModelRight tracks a Table's Column's Physical/Generation order and the PK/non-PK order (i.e. the order that is used when you display Columns in PK/non-PK order). Select this option if you want to keep the two orders in sync. If you want to allow them to diverge, then don't select this option. i.e. when you make a change to the PK/non-PK order the Generation order won't change and vice-versa.

Type - specify whether the current Table is a Relational or Object table. If its an object table then further specify its Type. For further information, see Oracle's Documentation on OR Tables.

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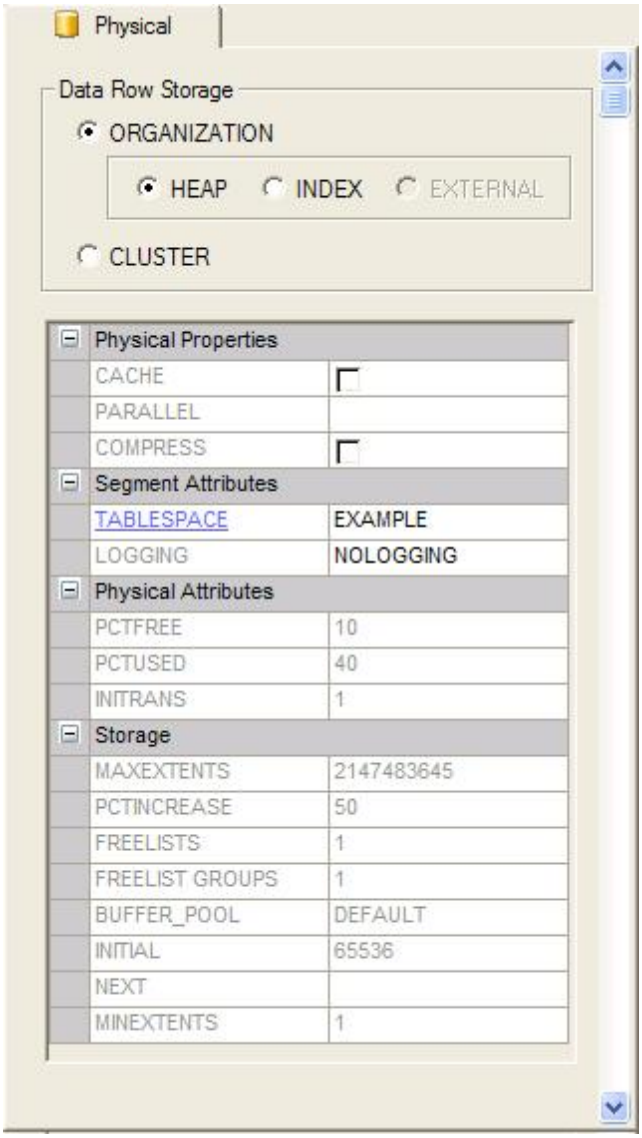
7.3.2 Physical Property Page

This Property Page corresponds closely to the Oracle documentation on Physical Properties for Segment Attributes, Physical Attributes and Storage.

If you select ORGANIZATION HEAP, then you will see the following



The Table Physical Property Page when Heap is the selected ORGANIZATION value.

You can create an index organized Table by selecting **ORGANIZATION->INDEX**. If you do, then ModelRight will add additional "IOT" rows to the Physical Properties control. And if you select the **OVERFLOW** option, a link to an Overflow Storage object will appear at the bottom. Click on it to enter Overflow Storage properties.

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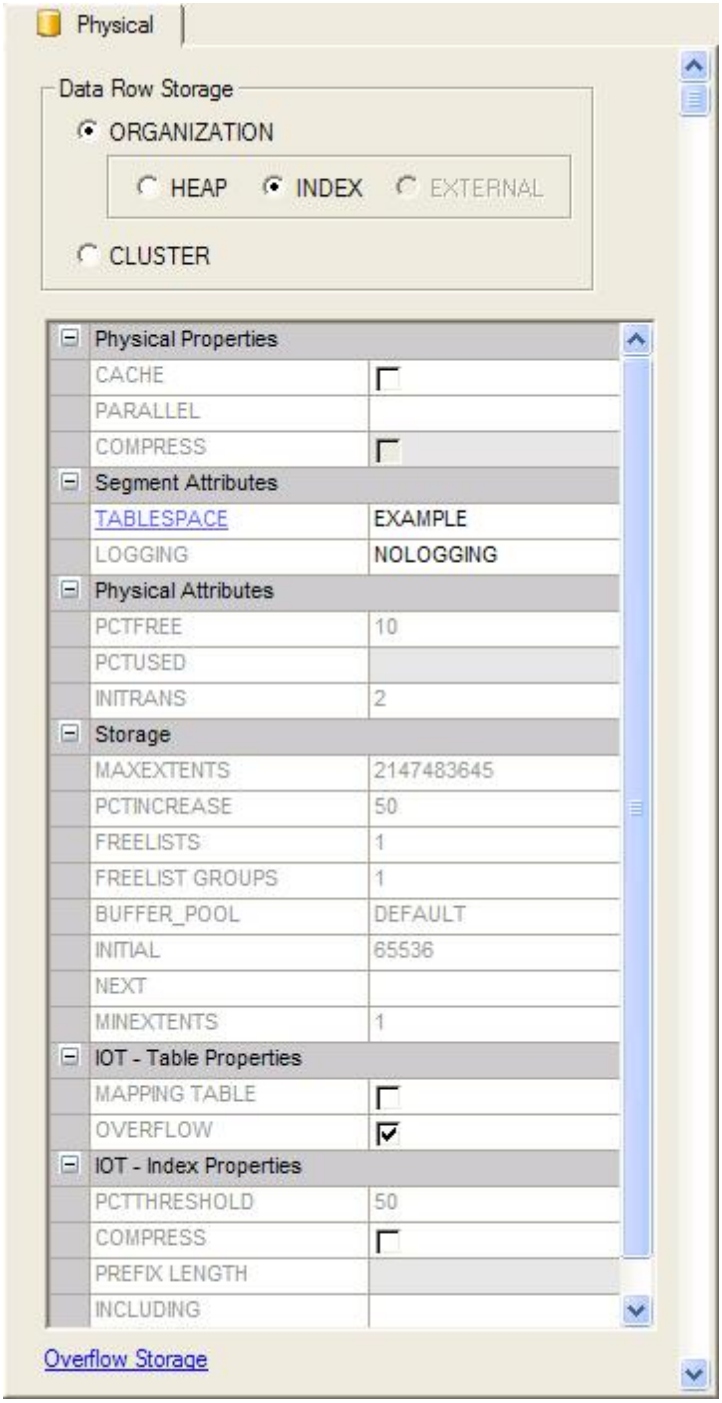

The Table Physical Property Page when Index is the selected ORGANIZATION value.

If you select **CLUSTER**, then the controls in this Property Page change to let you enter Cluster information. You can specify the Cluster that this Table belongs to and the Columns that correspond to the Cluster's columns.

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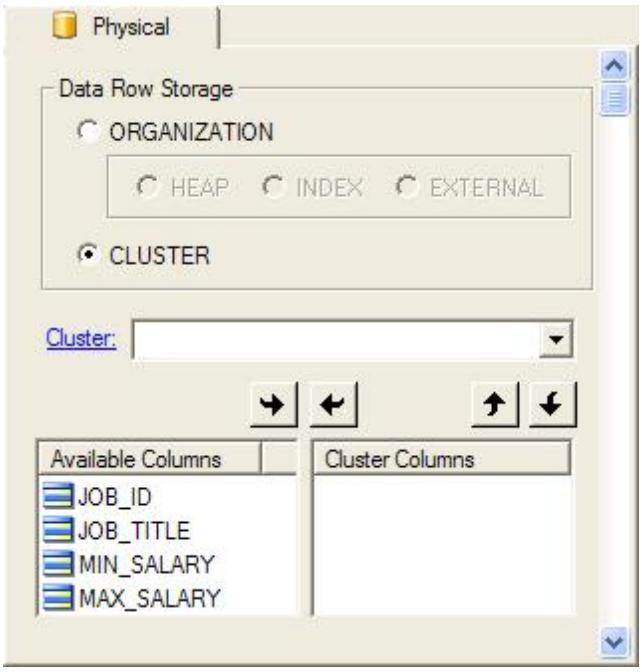
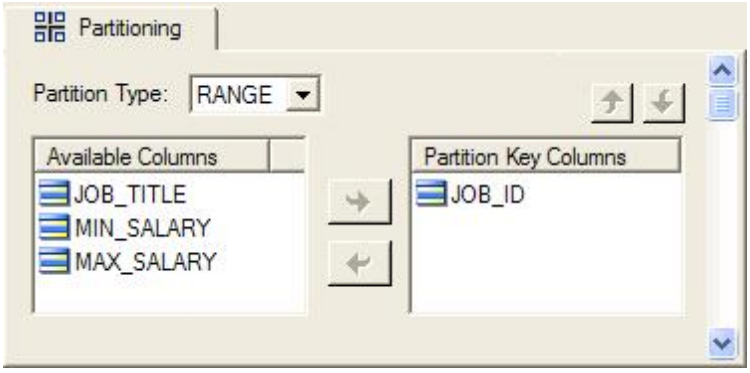


See Also

Physical Property Page.

7.3.3 Partition Property Page

If you select a Partition Type of RANGE, then the following controls will be displayed to let you enter a value for the Partition Key Columns. Plus, a Partition category is added to the Model Explorer, under the selected Table object, to let you create and edit Range Partitions.



If you select a Partition Type of LIST, then the following controls will be displayed to let you enter the List Key Column. Plus, a Partition category is added to the Model Explorer, under the selected Table object, to let you create and edit List Partitions:

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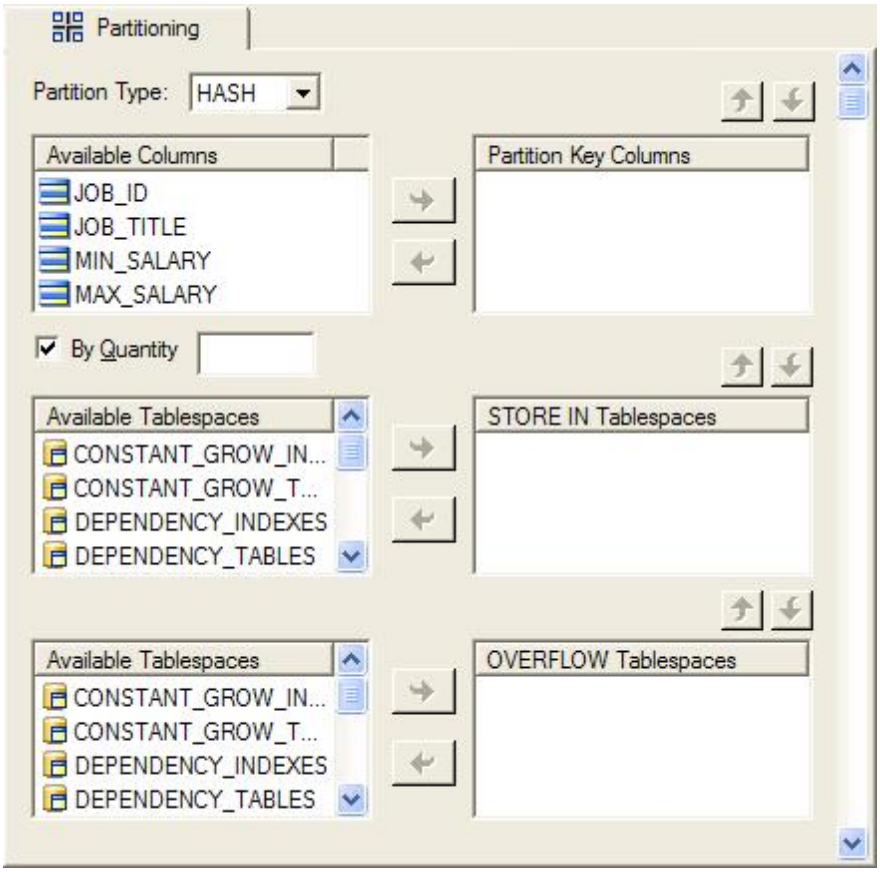
If you select a Partition Type of HASH, then the following controls will be displayed to let you enter the Partition Key Columns. Plus, a Partition category is added to the Model Explorer, under the selected Table object, to let you create and edit Hash Partitions. If you select the By Quantity option, then additional controls for the STORE IN and OVERFLOW Tablespaces will be displayed - and the Partition category in the Model Explorer will be removed.



7.3.4 Table Graphic Options

A Table Graphics object is used to represent a Table within a Diagram. i.e. it holds display properties like font and color that are used to draw the Table. Each Table that is displayed in a Diagram has an associated Table Graphic object that is owned by the Diagram.

When you select a Table in a Diagram, ModelRight automatically adds the corresponding Table Graphics object to the selection. That is why in the Property Browser you see the both the Table's Property Pages as well as the Graphics Property Page (for the Table Graphics object). Similarly, when you select a Table in the Model Explorer, ModelRight automatically adds its associated Table Graphics object from the active Diagram (if there is one) to the

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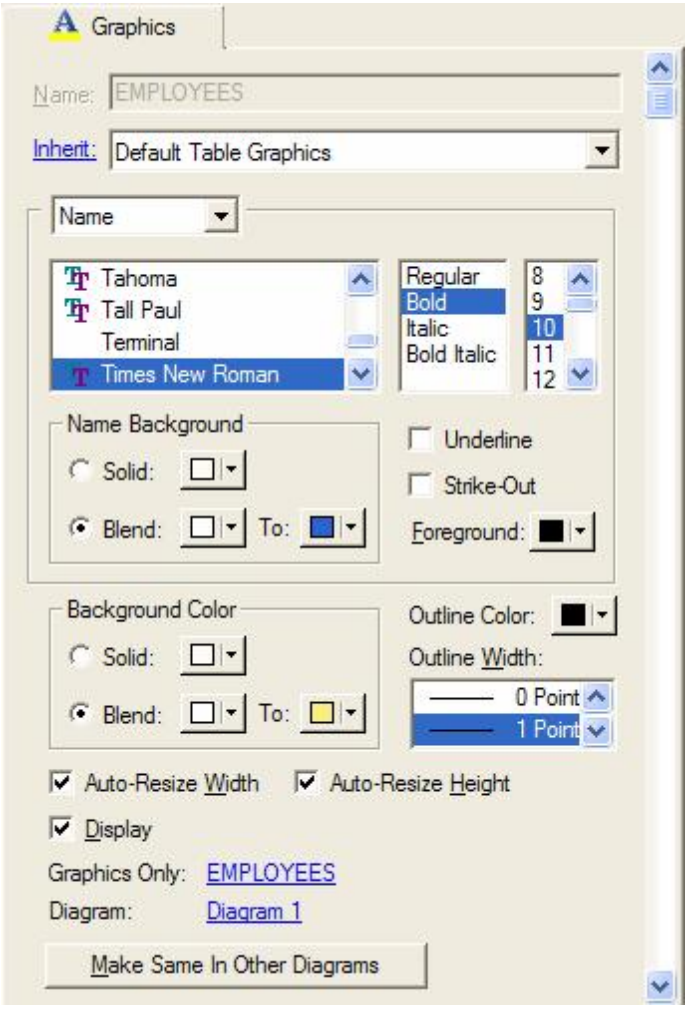
selection.



The Table Graphics tab

Auto-Resize Width/Height - by default, a Table automatically adjusts its width/height to accommodate its content. If however, you resize the width/height of a Table in a Diagram, ModelRight will use the width/height you specified regardless of how wide/high its content is. This control lets you tell ModelRight to auto-resize the Table (or not). You can also select this option from the context menu that appears when you right click on a Table in a Diagram.

Display - lets you hide/show a Table within a Diagram. If you want to hide all Tables within a Diagram, use the Diagram's Display Table Display option.

Graphics Only - click the Graphics Only link to select just the Table Graphics object. You may need to do this to reset any of its properties.

Diagram - a link to the Diagram object that owns the Table Graphics.

Make Same In Other Diagrams - copies the current Graphics properties to the corresponding Graphics objects in all the other Diagrams.

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The Default Table Graphics Template

By default, a Table Graphics object inherits from a Template called the Default Table Graphics. So to change a display property for all Tables in all Diagrams, simply select the Default Table Graphics object and make the change. You can select the Default Table Graphics object by:

1. going to the Templates tab in the Model Explorer and selecting the Default Table Graphics object in the Table Graphics Template category
2. selecting a Table in a Diagram, and then selecting the Inherit link in the Graphic tab
3. selecting

in the Shortcut Taskbar

If you right click on the background of the Diagrams section of the Model Explorer you can select Display Graphic Objects to view these objects in the Model Explorer. If you select one of these Graphic objects, you can view and modify the properties of the selected Graphics object in the Property Browser - including what Template the Graphic object inherits from.

Note: Printing blended colors isn't supported by Windows. So when printing a Diagram, the Solid option is used for Name Background, Background Color and Category Color - even if its not select for displaying the diagram on screen. This allows you to have some control over the color that is used for printing without having to change how the diagram is displayed.

7.4 View Property Pages

When you select a View, the following Property Pages will appear in the Property Browser:

View/General

Select

7.4.1 View Property Page

In ModelRight, a View is primarily defined by the Selects it contains. It can contain (own) one or more Selects that are combined with an operator (like UNION). A View's Columns are based on the first Select, unless it is an Object View - in which case its Columns are based on the selected Object Type. Since Selects are such a prominent part of defining a View, they are listed at the bottom of this page in the Select control. To jump to a Select object, simply click the button in the control.

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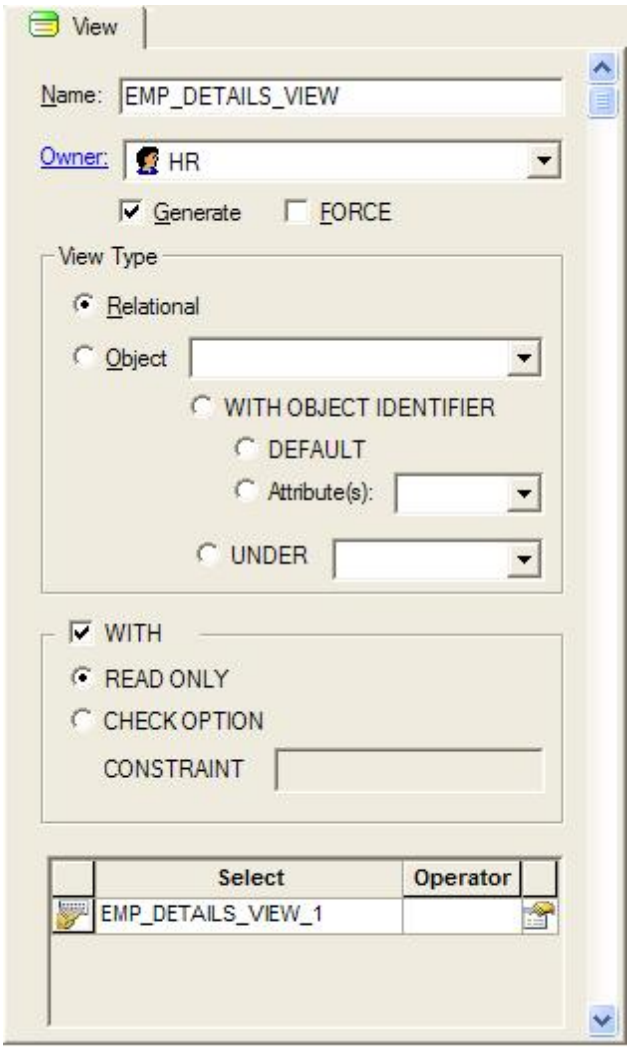

7.4.2 Select Property Pages

A View is primarily defined by the Selects it contains. The Select Property Pages let you specify the various parts of a Select. It contains tabs for defining the Select Columns and the From, Where, Group By and Having clauses. A Select Column can be either an expression or a simple reference to another Table or View's Column. References to other objects are kept up to date if the referenced object changes (i.e. renamed or deleted).

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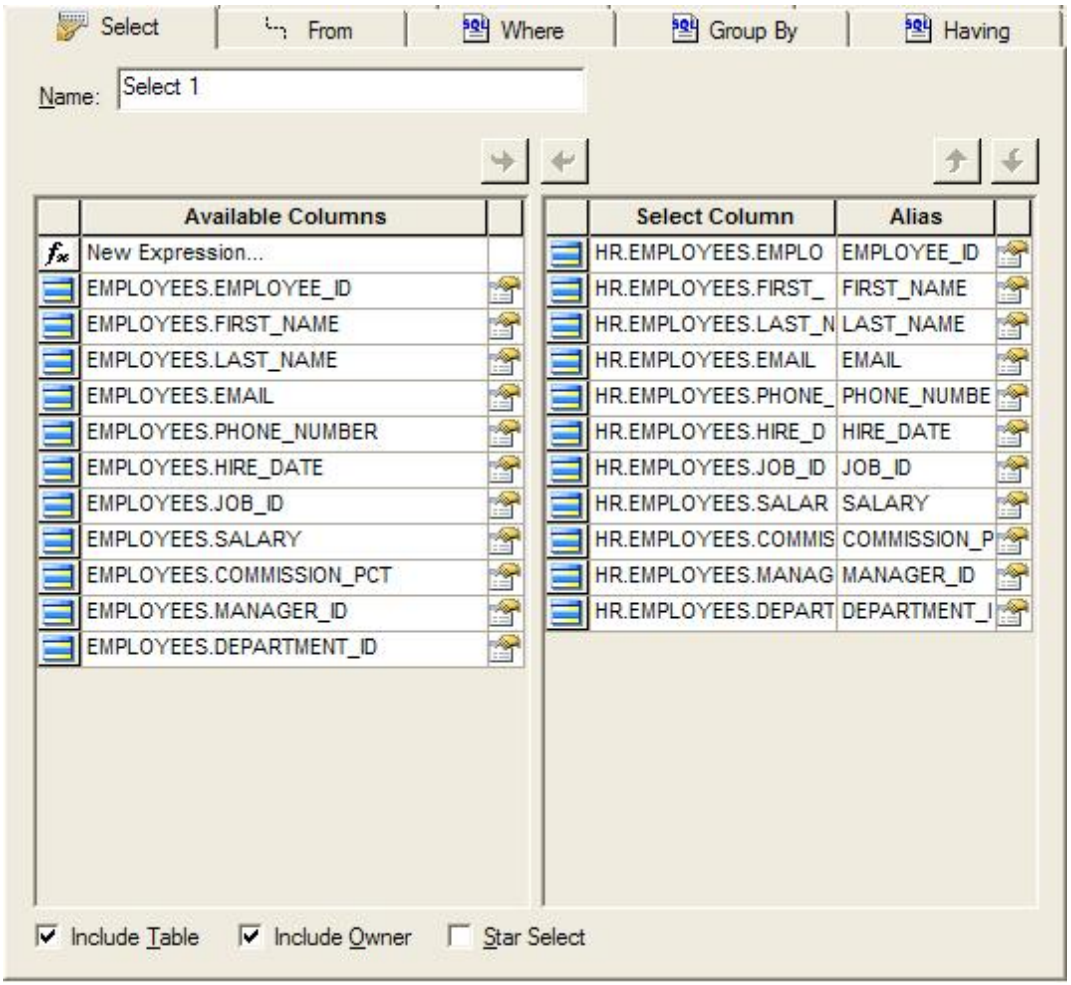

Include Table - When an Available Column is added to create a Select Column, this option is used to determine whether the Column will be prefixed with the name of the Table that owns it.

Include Owner - - When an Available Column is added to create a Select Column, this option is used to determine whether the Column will be prefixed with the owner of the Table that owns it.

Star Select - select this option if you want to generate "SELECT *". All of the Available Columns will be added as Select Columns and ModelRight will keep the Select Columns in sync with the underlying Tables/Views. However, ModelRight will always generate just "SELECT *" to create the Select statement.

7.5 Relation Property Pages

When you select a Relation, the following Property Pages will appear in the Property Browser:

Relation/General

Integrity

Migrate

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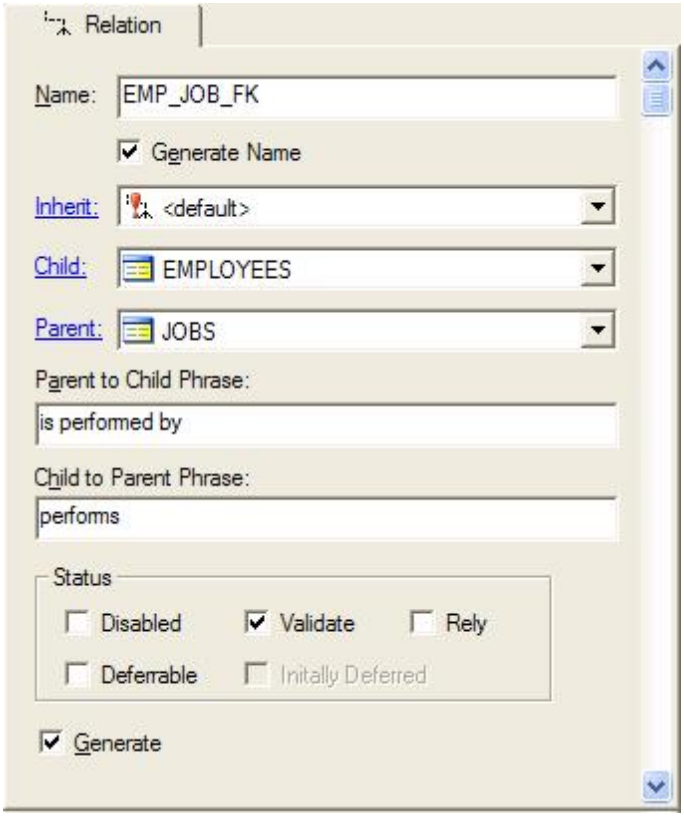
Graphic

7.5.1 Relation Property Page

The Relation page is provided to allow you to edit general properties of a Relation:



Name - used as the FK Constraint Name when generating the Relation to the database. The Name can be displayed on the diagram. See Diagram Relation Display Options.

Generate Name - indicates whether the Name should be generated (as the FK Constraint Name) to the database.

Child - The child Table. You can change it here or by drag/dropping the child endpoint on the Diagram.

Parent - The parent Table. You can change it here or by drag/dropping the parent endpoint on the Diagram.

Parent to Child Phrase - provided to help users "read" the Relation going from the parent Table to the child Table. In this case you would say a "JOB is performed by an EMPLOYEE". You can view the Parent to Child Phrase on the Diagram as well. See Diagram Relation Display Options.

Child to Parent Phrase - provided to help users "read" the Relation going from the child Table to the parent Table. In this case you would say "an EMPLOYEE performs a JOB". You can view the Child to Parent Phrase on the Diagram as well. See Diagram Relation Display Options.

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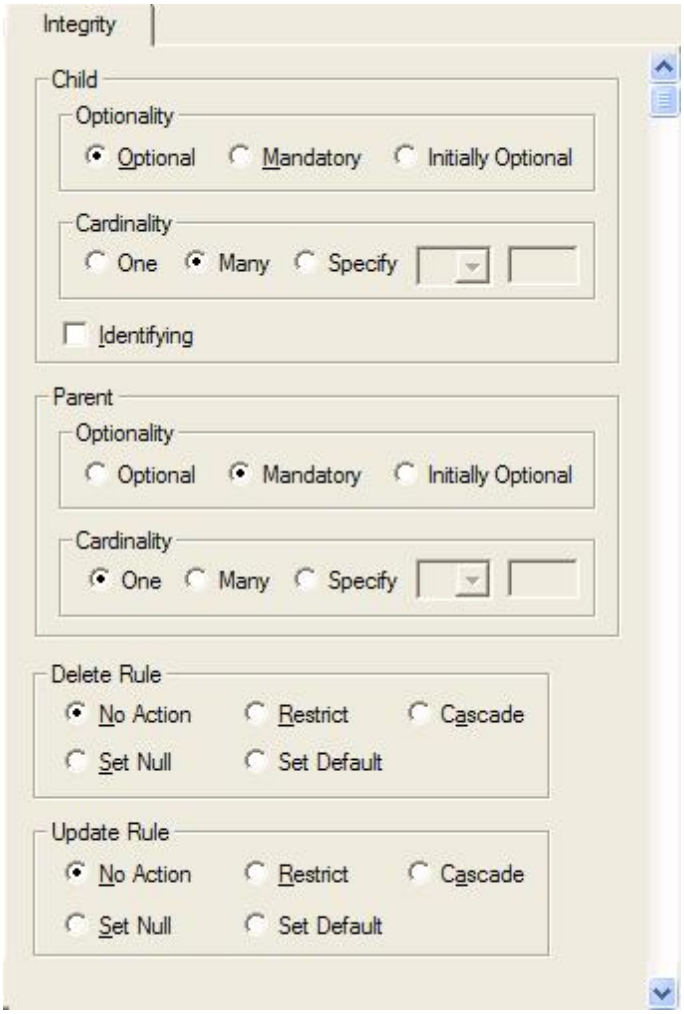
Status - The state of the Oracle constraint.

Generate - indicates whether or not the Relation should be generated to the database.

7.5.2 Integrity Property Page

The Integrity Page is provided to let you specify various aspects of how the Relation's Referential Integrity should be enforced. The database provides explicit support for enforcing some of these options (Delete Rule, Identifying). In the other cases (Optionality, Cardinality, Update Rule), you can specify values for documentation purposes or you could write a Trigger to read and enforce the option.



Relation Integrity Property Page for Barker Notation

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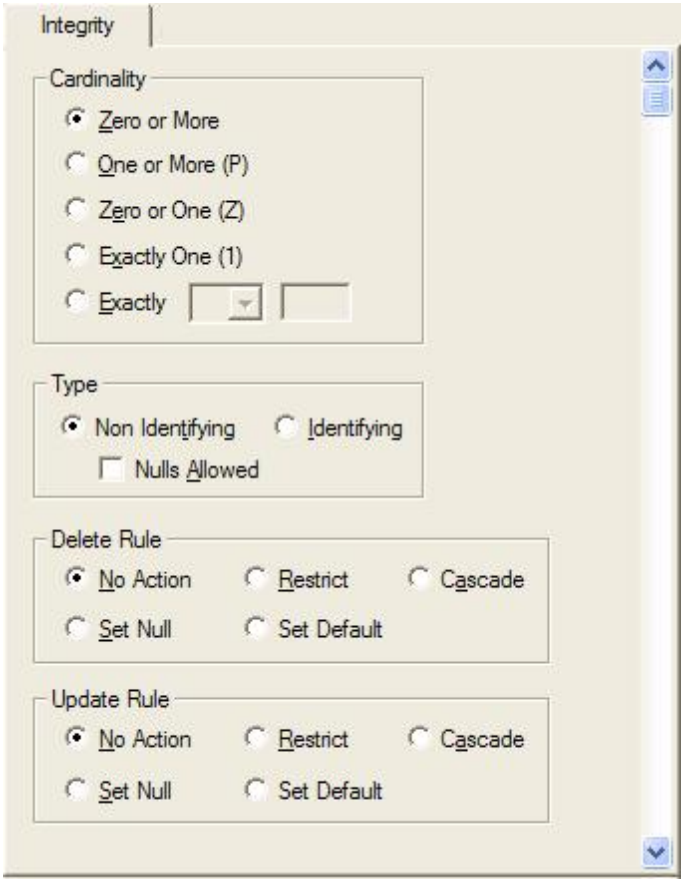

Relation Integrity Property Page for IDEF1X Notation

Child Optionality - whether there must be a row in the child Table for each row in the parent Table.

Child Cardinality - how many rows can be in the child Table for each row in the parent Table

Identifying - indicates whether the parent key is part of the child's primary key

Parent Optionality - indicates whether there must be a row in the parent Table for each row in the child Table

Parent Cardinality - indicates how many rows in the parent Table there must be for each row in the child Table

Delete Rule - when a row in the parent Table is deleted, what should happen to corresponding child Table rows. Some of these options (like No Action, Cascade and Set Null) are explicitly supported by Oracle. The others would need to be enforced using Triggers.

Update Rule - when a row in the parent Table is updated, what should happen to corresponding child Table rows. These options would need to be enforced using Triggers.

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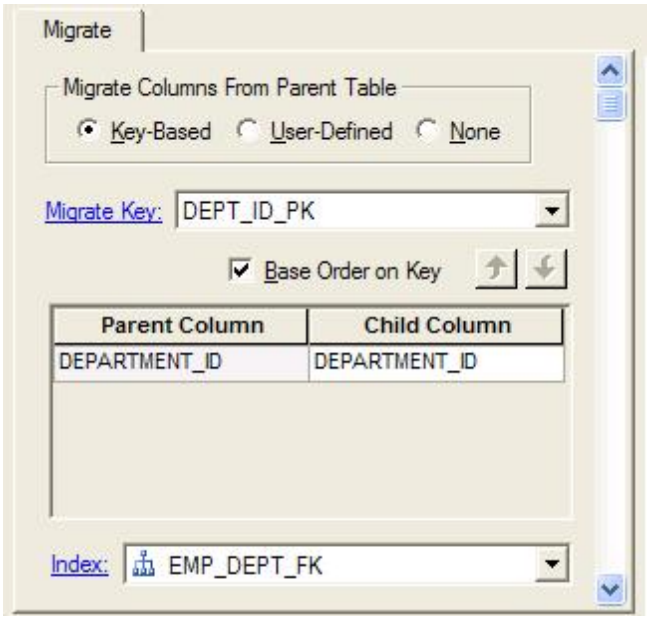
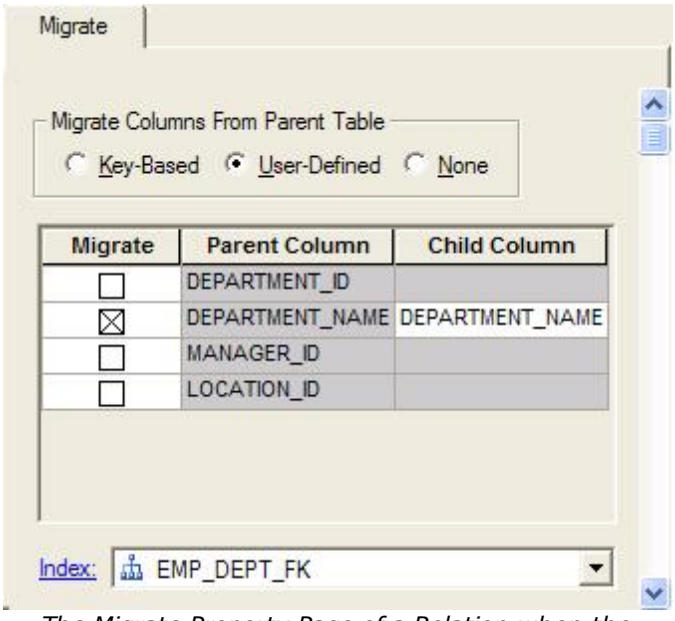
7.5.3 Migrate Property Page

The Migrate Property Page allows you to specify what Columns in the parent Table you want to "migrate" to be "foreign key" Columns in the child Table. ModelRight automatically creates foreign key Columns in a Relation's child Table for certain Columns in the parent Table. This is referred to as Migration. By default, ModelRight migrates the Columns in the parent Table's primary key to be foreign key Columns in the child Table. This ensures that you can use a foreign key constraint (i.e. the CREATE FOREIGN KEY statement) to enforce referential integrity declaratively (vs programmatically with a Trigger).



The Migrate Property Page of a Relation when Key-Based migration is selected



The Migrate Property Page of a Relation when the User-Defined migration option is selection

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Migrate Columns From Parent Table

Lets you specify how you want to migrate parent Columns. You have the following three options:

- Key-Based - the default option. Migrates Primary or Unique Key columns from the parent Table to the child Table. If a Column is added/removed from the migrated Key, then a foreign key Column will automatically be added/removed from the Child table. This option will be enforced in the database by using declarative referential integrity (i.e. the CREATE FOREIGN KEY statement).
- User-Defined - lets you manually specify which parent Columns you want to migrate. This option can not be enforced declaratively, but could be enforced with a Trigger.
- None - indicates that you don't want the Relation to migrate any Columns.

Migrate Key

If doing Key-Based migration, this control will let you select which key you would like to migrate. ModelRight lets you migrate either a Unique key or a Primary key.

Parent Column/Child Column

If you want the foreign key Column to have a different name than the parent Column, you can "rolename" it using this control. Once the child Column has a different name than the parent column, changes to the name of the parent column will no longer automatically propagate to the child.

Index

This combo box displays the index, if any, that is associated with the Relation. Often you will want to associate an Index with a Relation to speed joins between the parent and child Tables. If no Index exists for the Relation, you can easily create one by selecting the <Create Join Index> option. If an Index already exists, but has not been associated with the Relation, you can select it to make the association. ModelRight automatically keeps the Columns in the Index in sync with the foreign key Columns contributed by the Relation. If the relation is deleted (or the Index set to <None>), the associated Index will be deleted as well.

See Also

Migration, Unification, and Rolenaming

7.5.4 Relation Graphics Property Page

A Relation Graphics object is used to represent a Relation within a Diagram. i.e. it holds display properties like for font and color that are used to draw the Relation. A Diagram owns a Relation Graphics object for each Relation displayed in the Diagram.

When you select a Relation in a Diagram, ModelRight automatically adds the corresponding Relation Graphics object to the selection. That is why in the Property Browser you see the

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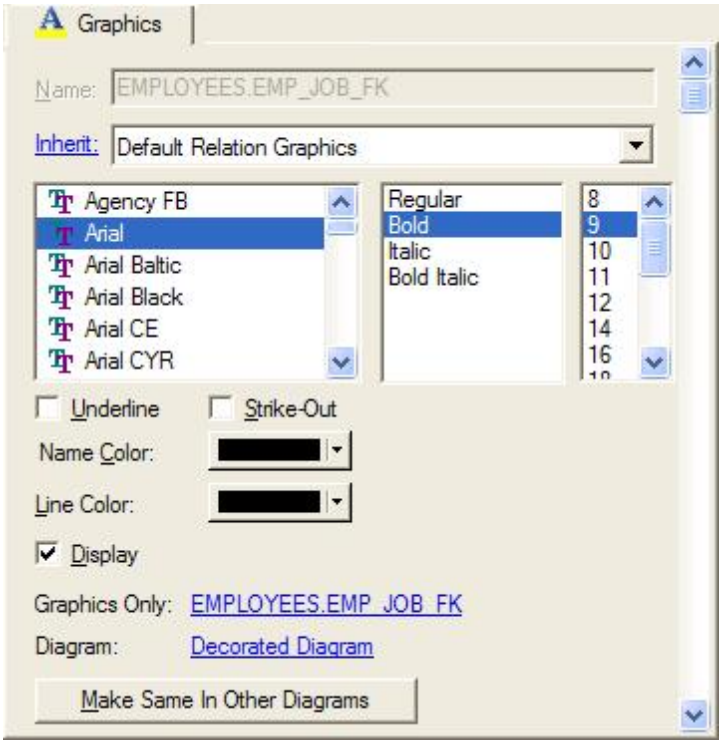
both the Relation Property Pages as well as the Graphics Property Page (for the Relation Graphics object). Similarly, when you select a Relation in the Model Explorer, ModelRight automatically adds its associated Relation Graphics object from the active Diagram (if there is one) to the selection.



Inherit - select which Relation Graphics Template you want the current Relation Graphics object to inherit properties from.

Graphics Only - click the Graphics Only link to select just the Relation Graphics object. You may need to do this to reset its properties.

Diagram - a link to the Diagram object that owns the Relation Graphics object.

Make Same In Other Diagrams - copies the current Graphics properties to the corresponding Graphics objects in all the other Diagrams.

The Default Relation Graphics Template

By default, a Relation Graphics object inherits from a Template called the Default Relation Graphics. So to change a display property for all Relations in all Diagrams, simply select the Default Relation Graphics object and make the change. You can select the Default Relation Graphics object by:

1. going to the Templates tab in the Model Explorer and selecting the Default Relation Graphics object in the Relation Graphics Template category
2. selecting a Relation in a Diagram, and then selecting the Inherit link in the Graphic tab

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3. selecting

in the Shortcut Taskbar

If you right click on the background of the Diagrams section of the Model Explorer you can select **Display Graphic Objects** to view these objects in the Model Explorer. If you select one of these Graphic objects, you can view and modify the properties of the selected Graphics object in the Property Browser.

7.6 Trigger Property Pages

In ModelRight, you can create a Table-level Trigger or a Model-level Trigger. A Table-level Trigger is owned by a Table and can reference the Table's Columns as Update Columns. The Trigger's Bodycan be specified directly, as a VB Script that evaluates to the body, or as a reference to a reusable VB Script.

7.6.1 Trigger Property Page

Use this Property Page to enter basic information about your Trigger. If you are editing a Model-level Trigger, then the Update Columns control will not be displayed.

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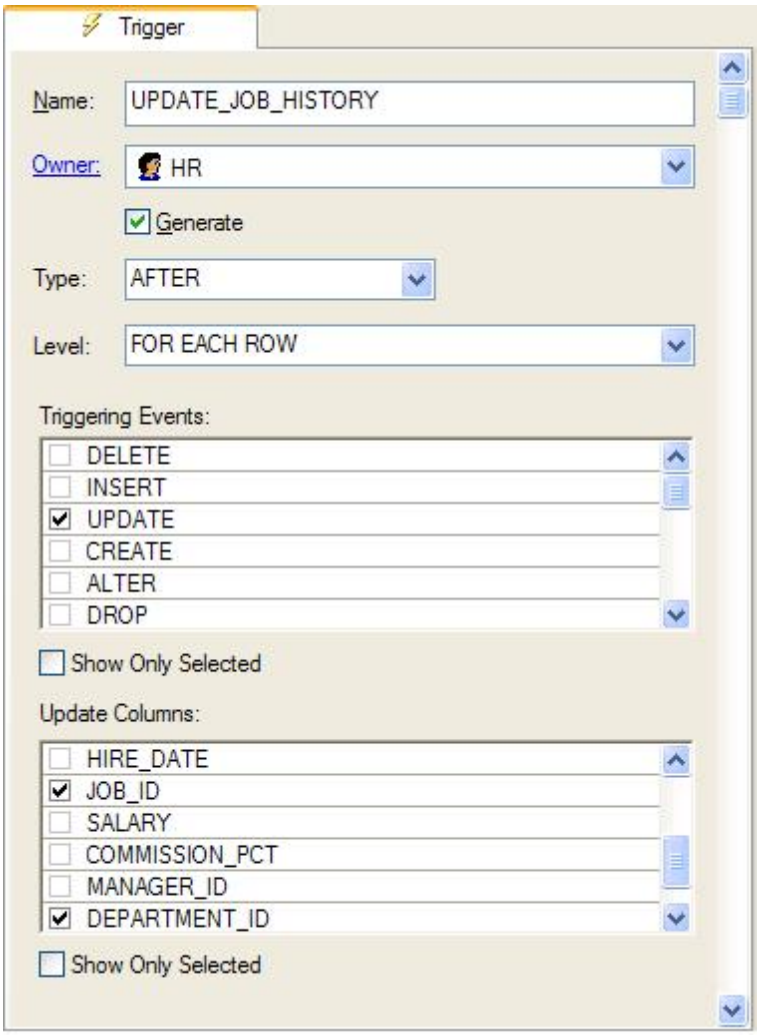

A Table-level Trigger Property Page with the Update Columns control

7.6.2 Trigger Body Property Page

The Trigger's body can be defined in three different ways:

1. You can enter the SQL directly. If you just want to enter the Trigger body's SQL directly, hit the Run Script toolbar button and type it in.
2. You can enter a VB Script that when evaluated will produce the Trigger Body's SQL. Hit the Edit Script toolbar button and type it in. If you are writing a Table Trigger, the VB Script can evaluate the Table's Relations to enforce referential constraints that are not implemented declaratively by the database.
3. Use the **Script Type** control to select a reusable Trigger Body VB Script that has been entered in the Script Explorer under **Scripts->"database name"->Trigger Body**. A shortcut to this location has been provided on the Edit Script page.

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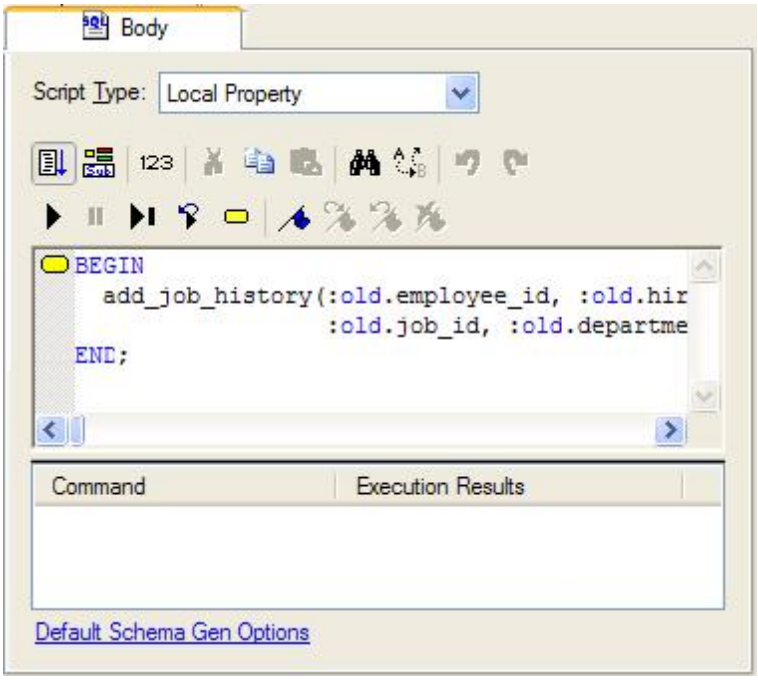

The Trigger Body Property Page when the run button has been selected.

7.7 Schema Gen Option Set

A Schema Gen Option Set object is used to specify Schema Gen/Forward Engineering options. It is used to specify Schema Gen options like:

- Generate Comments
- Use Owner Names
- Generate Constraint Names
- Quote Names
- Physical Storage Properties
- whether to Create or Drop Tables, Views, Indexes, Foreign Keys, etc...

Two Schema Gen Option Sets are created automatically by ModelRight: The Default Schema Gen Options serves as the default for Forward Engineering, and the Alter Script Schema Gen Options is the default Option Set that is used when creating Alter Scripts. Click the **Make Current** checkbox at the bottom of the Property Page to make it the one that is used by default.

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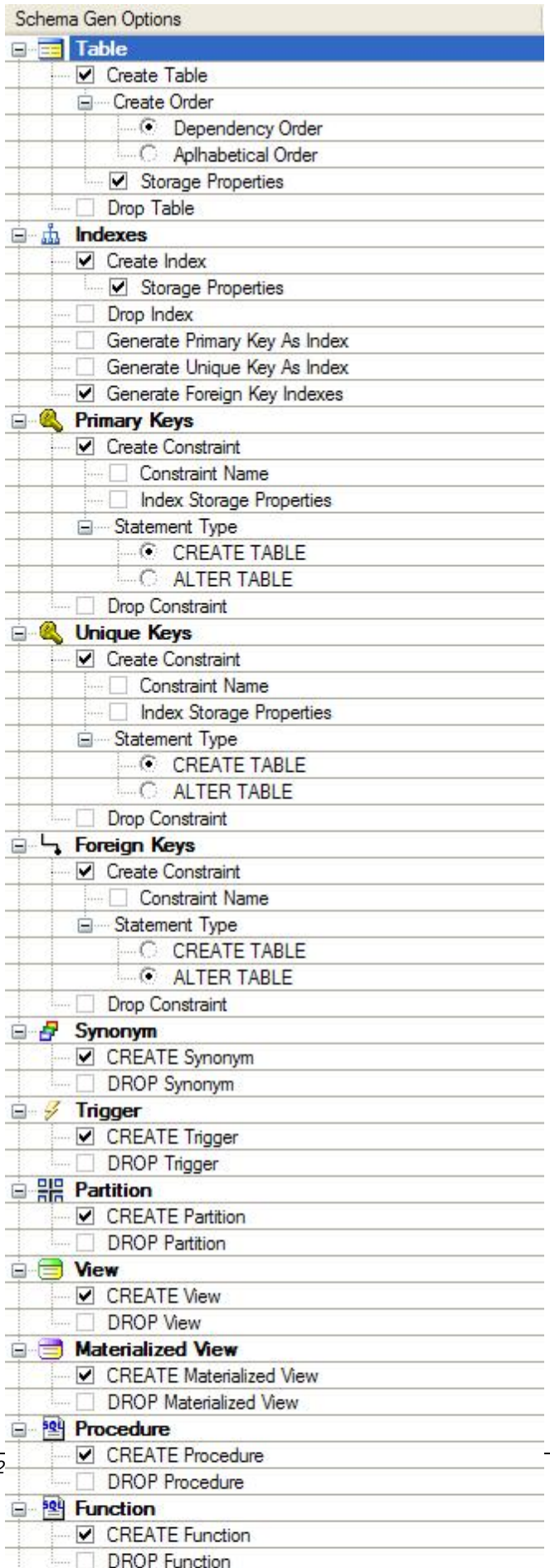
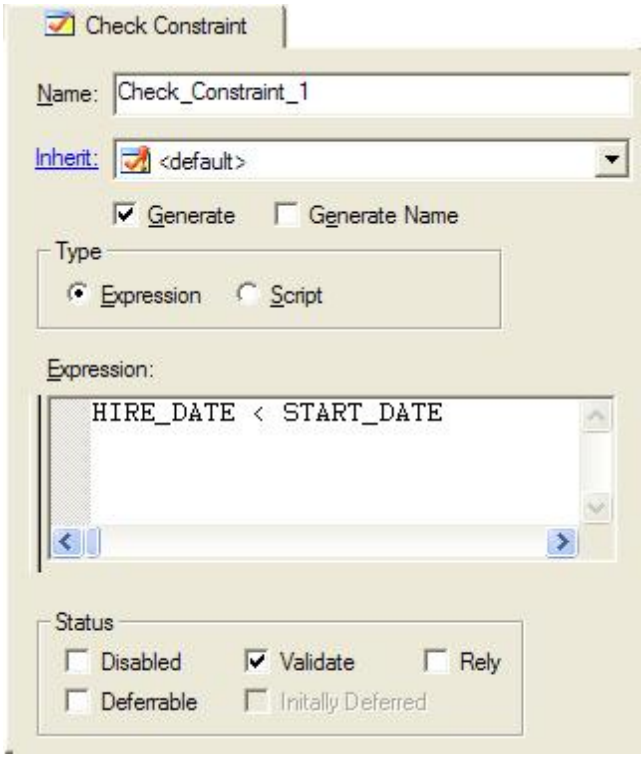

Schema Gen Options
Table
Create Table
Create Order
Dependency Order
Aplhabetical Order
Storage Properties
Drop Table
Indexes
Create Index
Storage Properties
Drop Index
Generate Primary Key As Index
Generate Unique Key As Index
Generate Foreign Key Indexes
Primary Keys
Create Constraint
Constraint Name
Index Storage Properties
Statement Type
CREATE TABLE
ALTER TABLE
Drop Constraint
Unique Keys
Create Constraint
Constraint Name
Index Storage Properties
Statement Type
CREATE TABLE
ALTER TABLE
Drop Constraint
Foreign Keys
Create Constraint
Constraint Name
Statement Type
CREATE TABLE
ALTER TABLE
Drop Constraint
Synonym
CREATE Synonym
DROP Synonym
Trigger
CREATE Trigger
DROP Trigger
Partition
CREATE Partition
DROP Partition
View
CREATE View
DROP View
Materialized View
CREATE Materialized View
DROP Materialized View
Procedure
CREATE Procedure
DROP Procedure
Function
CREATE Function
DROP Function

7.8 Check Constraints

ModelRight allows you to create both Table and Column Check Constraints. A Check Constraint object is owned by the Table or Column that it is applied to. You can also create Check Constraint Templates so that you can specify a constraint in one place and then reuse it throughout your Model - via inheritance. To have a Column or Table Check Constraint reuse a Check Constraint Template, simply select it in the Inherit control. In ModelRight, a Table Check Constraint can either be an **Expression** or a **Script**:



An Table Check Constraint of type Expression

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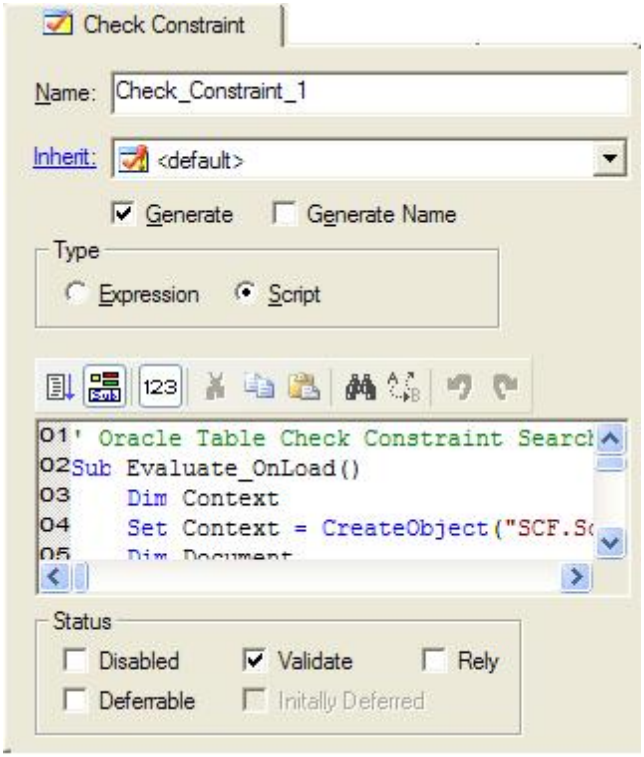
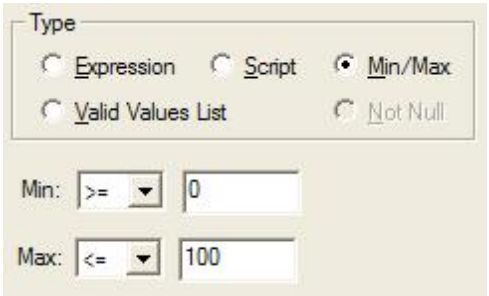


A Table Check Constraint of type Script

Expression - enter a Boolean expression involving the Table's Columns. Double-click on a Column in the **Available Columns** control to add the Column's name to the Expression edit control.

Script - enter a VB Script that will be evaluated to produce the Check Constraint.

A Column Check Constraint contains a few more options: **Min/Max**, **Valid Values List**, and **Not Null**:



Part of the Column Check Constraint Page with Min/Max selected.

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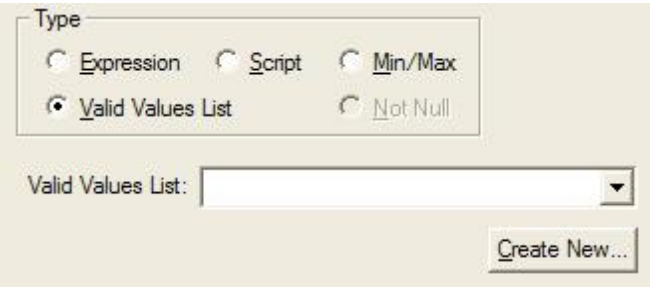
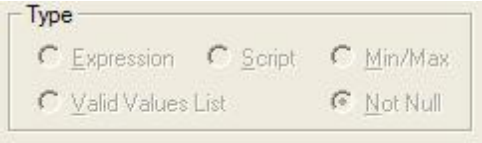


Part of the Column Check Constraint Page with Valid Values List selected



Part of the Column Check Constraint Page when the Not Null option is selected.

Min/Max - specify a min condition and value and/or a max condition and value

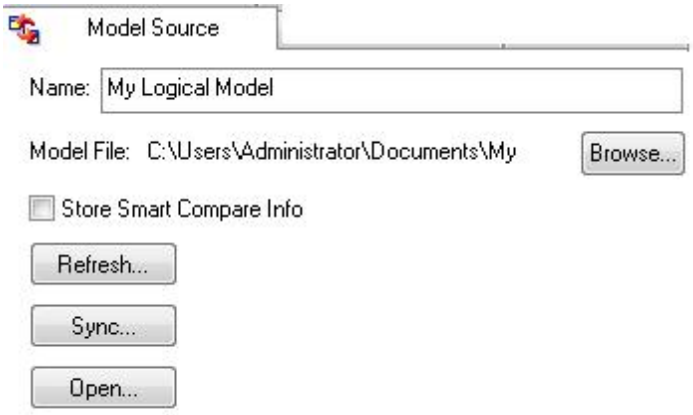
Valid Values - Valid Value Lists are defined as independent objects (children of the Model) and just referenced/attached here. To quickly create and attach a new Valid Values List object, click the **Create New...** button.

Not Null - a Not Null Column Check Constraint is automatically created and deleted by ModelRight based on the NOT NULL checkbox control in the Column Property Page.

7.9 Model Source

A Model Source stores information about Model to Model compares so that previously matched objects are matched even if their name changes. A Model Source allows you to see what has changed on either side since the last time they were compared. It also allows you to update your Model automatically with changes made in the Model Source (see Refresh).

The following page is displayed in the Property Browser when a Model Source object is selected:



Model Source property page

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Model File - the last known location of the Model Source file. Browse to select a new location.

Store Smart Compare Info - controls whether or not information about which Model changed objects and properties is maintained.

Refresh - if the Model Source Model saves its Change History (see Save Model Change History), then this button will be enabled and allow you to update your Model with any changes that have been made to the Model Source Model since the last Sync or Refresh.

Sync - shortcut button to start a Model to Model Compare using the selected Model Source

Open - shortcut button to open the Model Source's linked Model.

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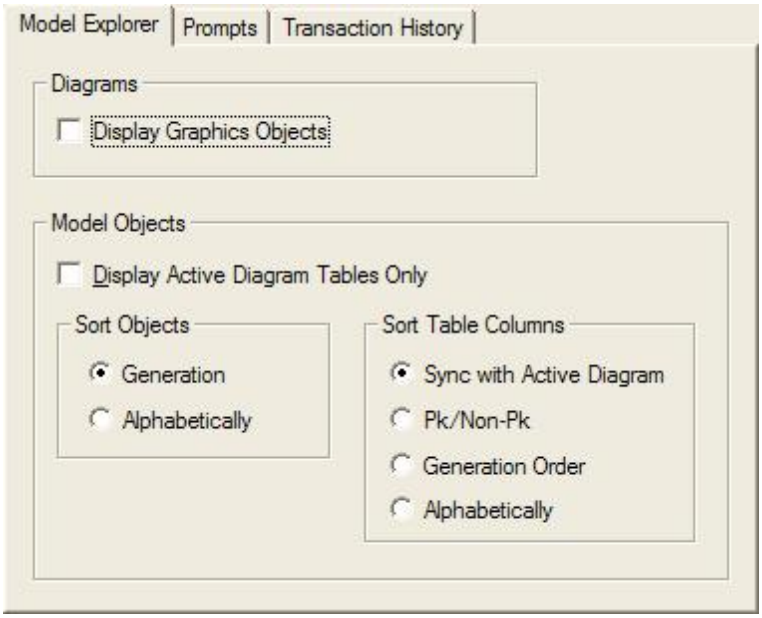
8 Dialogs

This section describes some of the Windows that ModelRight uses.

8.1 Options

The **Tools->Options** dialog is provided to let you view and edit application-wide preferences. These values are used across Models and are stored in the Windows system registry.

These options are also displayed in the context menu that is displayed when you right-click on the background of the Model Explorer.



This page lets you turn back on prompts that you previously turned off and indicated not to ask you about again.

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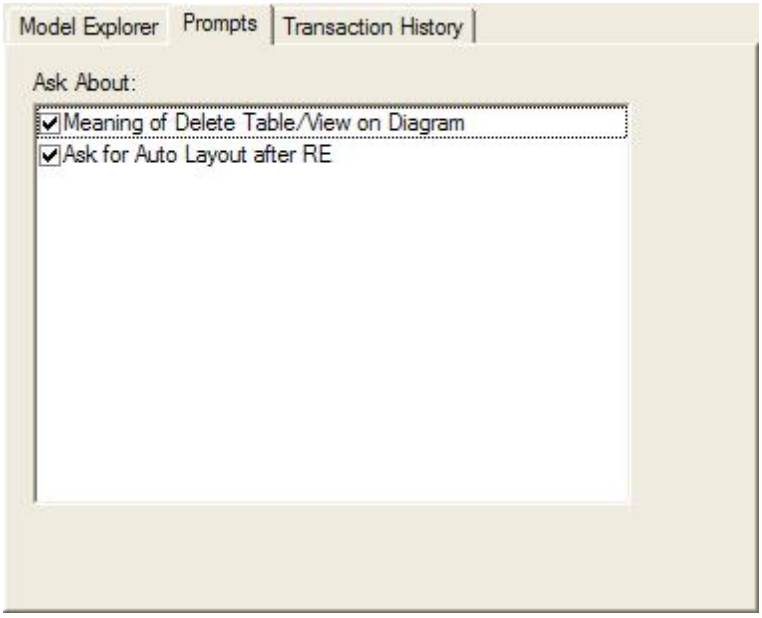
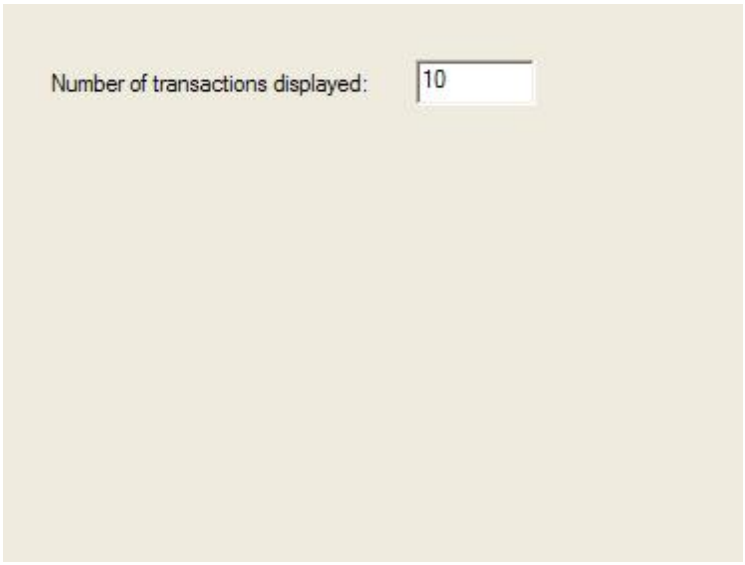


This page lets you specify the number of transactions to be displayed in the Transaction History Window.



8.2 Model Browser

The Model Browser is located under the Tools menu. It displays all of a Model's objects and properties in a tree format. It provides a "raw", unfiltered, read-only view of the Model's objects and properties.

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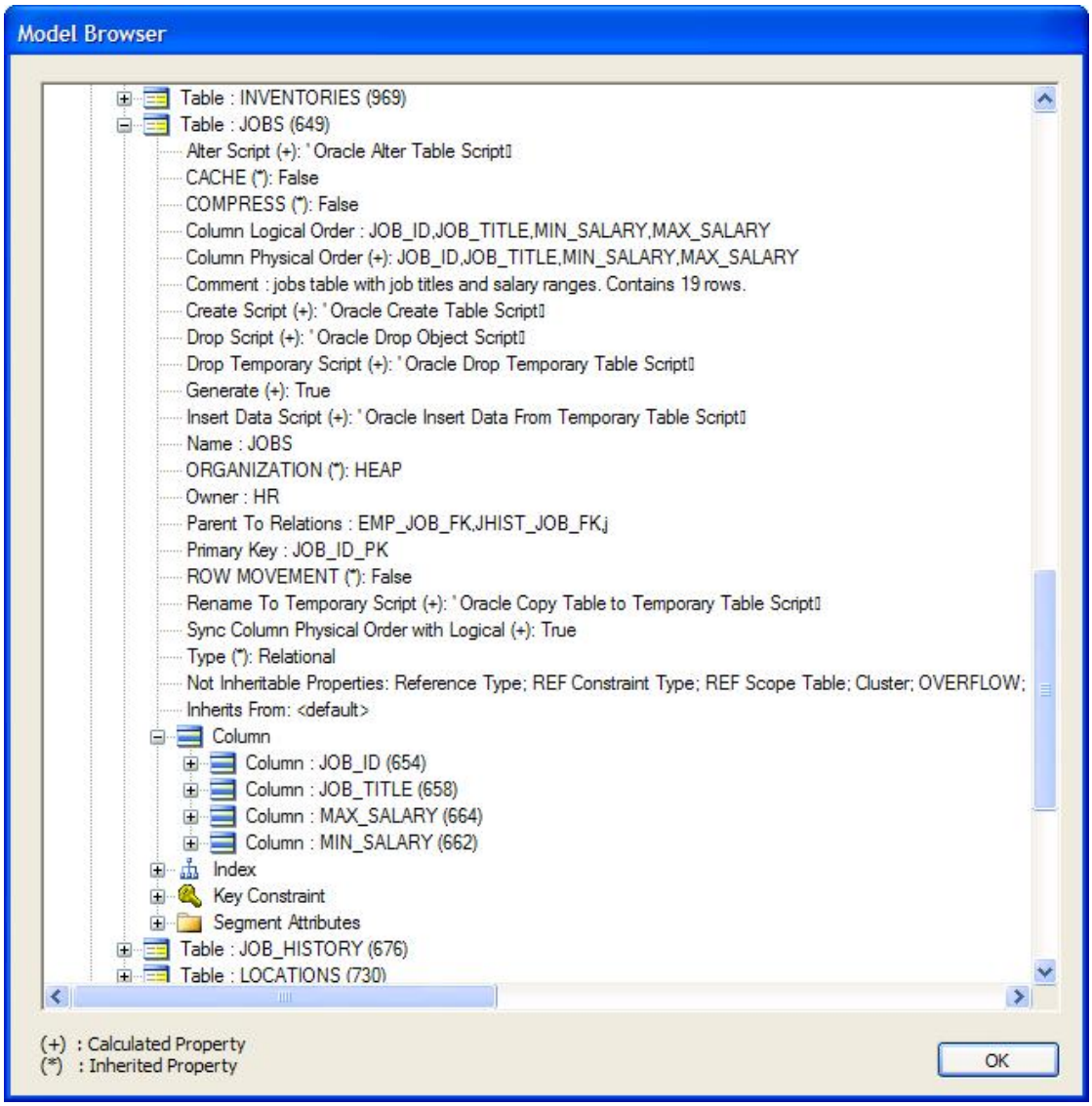
Model Browser
Table : INVENTORIES (969)
Table : JOBS (649)
Alter Script (+): ' Oracle Alter Table Script
CACHE (*): False
COMPRESS (*): False
Column Logical Order : JOB_ID,JOB_TITLE,MIN_SALARY,MAX_SALARY
Column Physical Order (+): JOB_ID,JOB_TITLE,MIN_SALARY,MAX_SALARY
Comment : jobs table with job titles and salary ranges. Contains 19 rows.
Create Script (+): ' Oracle Create Table Script
Drop Script (+): ' Oracle Drop Object Script
Drop Temporary Script (+): ' Oracle Drop Temporary Table Script
Generate (+): True
Insert Data Script (+): ' Oracle Insert Data From Temporary Table Script
Name : JOBS
ORGANIZATION (*): HEAP
Owner : HR
Parent To Relations : EMP_JOB_FK,JHIST_JOB_FKj
Primary Key : JOB_ID_PK
ROW MOVEMENT (*): False
Rename To Temporary Script (+): ' Oracle Copy Table to Temporary Table Script
Sync Column Physical Order with Logical (+): True
Type (*): Relational
Not Inheritable Properties: Reference Type; REF Constraint Type; REF Scope Table; Cluster; OVERFLOW;
Inherits From: <default>
Column
Column : JOB_ID (654)
Column : JOB_TITLE (658)
Column : MAX_SALARY (664)
Column : MIN_SALARY (662)
Index
Key Constraint
Segment Attributes
Table : JOB_HISTORY (676)
Table : LOCATIONS (730)
(+) : Calculated Property
(*) : Inherited Property
OK

8.3 Meta Model Browser

The Meta Model Browser is located under the Tools menu. It describes what properties an object can have and what type of child objects it can own.. If you use ModelRight's scripting capabilities, you need to know this information so that you can programmatically navigate an object's children or reference it's properties. ModelRight provides a Meta Model Browser that displays this information in tree format

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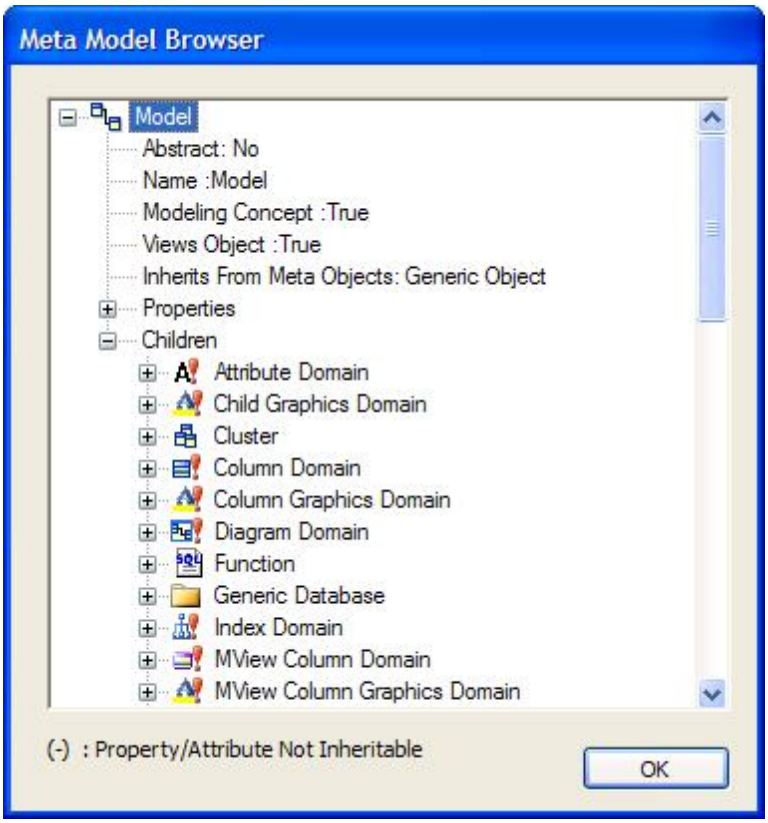
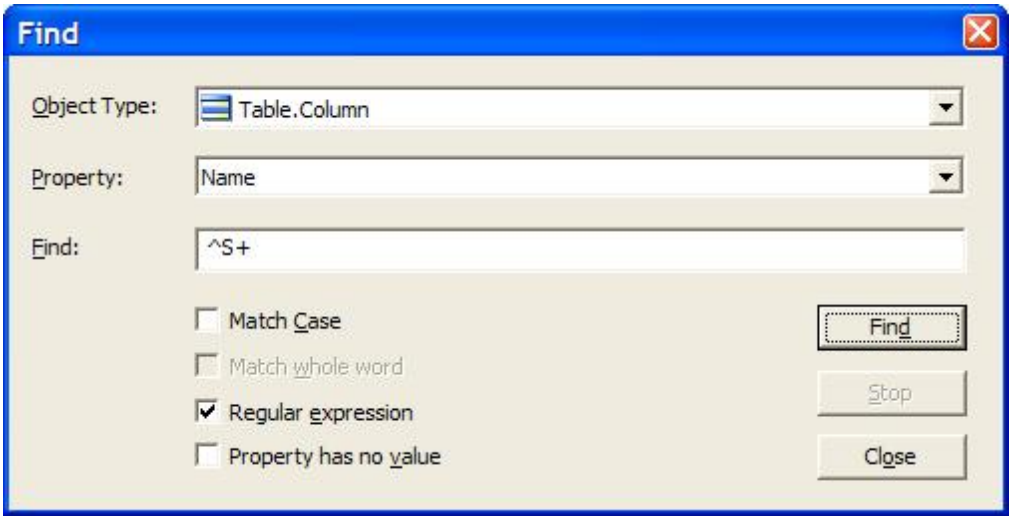


8.4 Find

The Find dialog provides a powerful means of searching for objects in your model. You can search by the type of object that you want to find, the property that you want to match, and a value that you want that property to match. For example, the following dialog settings could be used to find all Columns whose Name starts with the letter "S":



The regular expression syntax that ModelRight uses allows you to specify complex pattern

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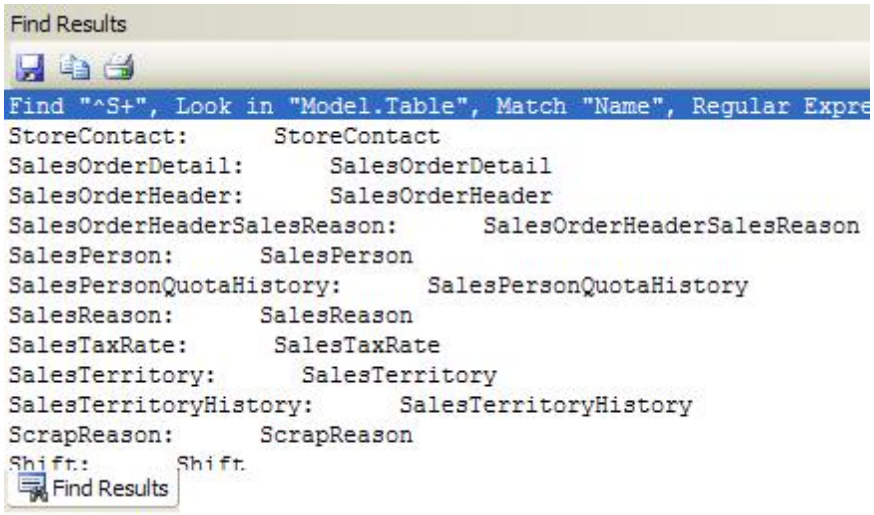
matches.

You can select **Property has no value** to search for objects that don't have a value for the given property - like Tables without a Tablespace or Owner.

The results of the Find are listed in the Find Results window (by default in a tab at the bottom of the application). When you select an item in the Find Results window, the corresponding object is selected. The Find Results window allows extended selections so you can select multiple items and make changes them all at once (using their Property Pages).

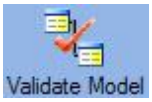


Search Toolbar

What could be more basic? But it is surprising that ModelRight 4.0 is the only product to offer such a basic feature with all the flexibility you need to find any kind of object that matches your search criteria. ModelRight has always had a Find capability to help with this, but now ModelRight 4.0 provides a search control right in the toolbar for even easier access to common searches.

Search control in main toolbar

8.5 Model Validation

Selecting the menu item **Model** -> **Validate**, or the Shortcut Task 

brings up the Model Validation dialog. This dialog allows you to check your model for commonly occurring problems and issues. Entries marked with a red dot ● indicate an issue that will prevent the

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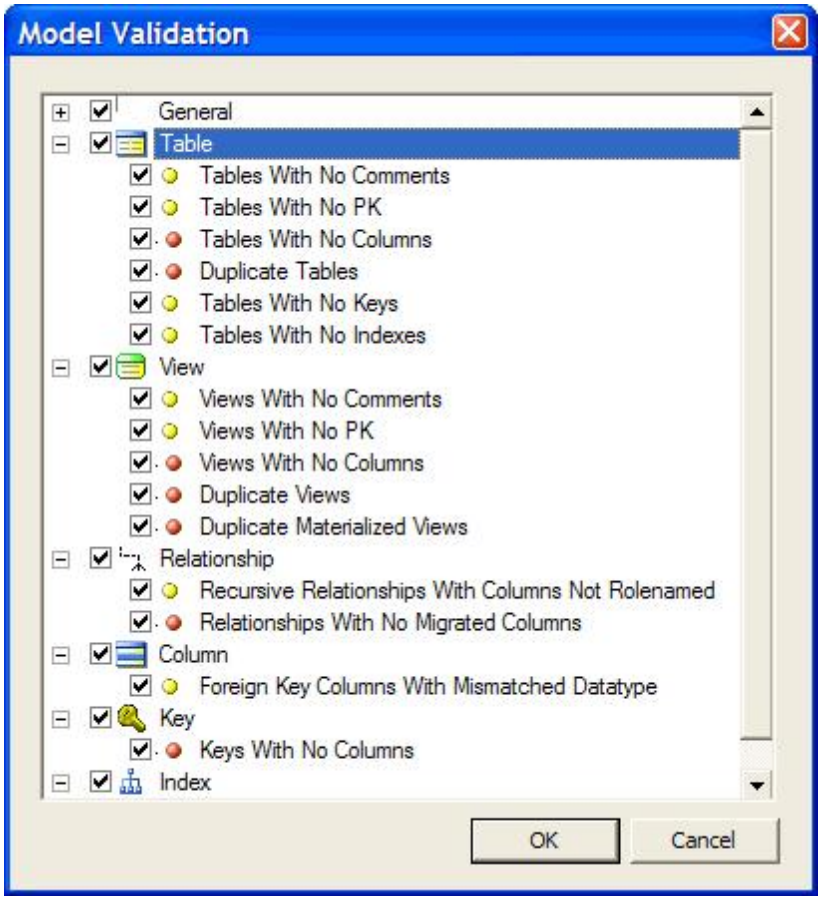
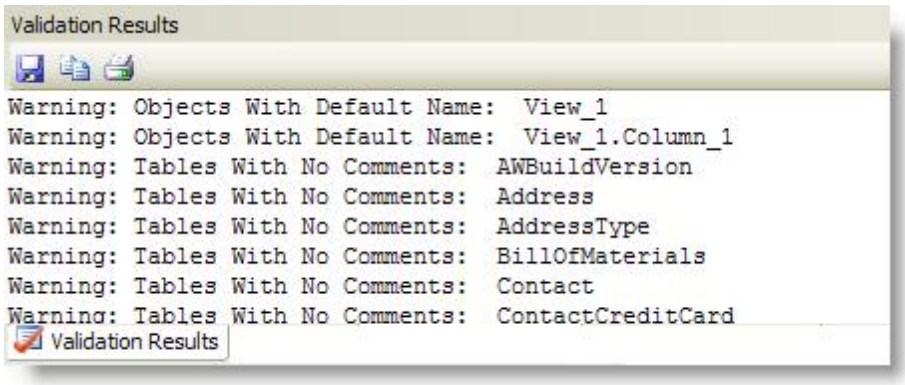
model from generating to the database. Entries marked with a yellow dot ● indicate a possible issue, but not something that would prevent your model from generating to the database.



The results of running a Model Validation are displayed in the Validation Results window. When you select an item in this window, the corresponding object is selected. The Validation Results window allows extended selections so you can select multiple items and make changes them all at once (using their Property Pages).


Validation Results
Warning: Objects With Default Name: View_1
Warning: Objects With Default Name: View_1.Column_1
Warning: Tables With No Comments: AWBuildVersion
Warning: Tables With No Comments: Address
Warning: Tables With No Comments: AddressType
Warning: Tables With No Comments: BillOfMaterials
Warning: Tables With No Comments: Contact
Warning: Tables With No Comments: ContactCreditCard
Validation Results

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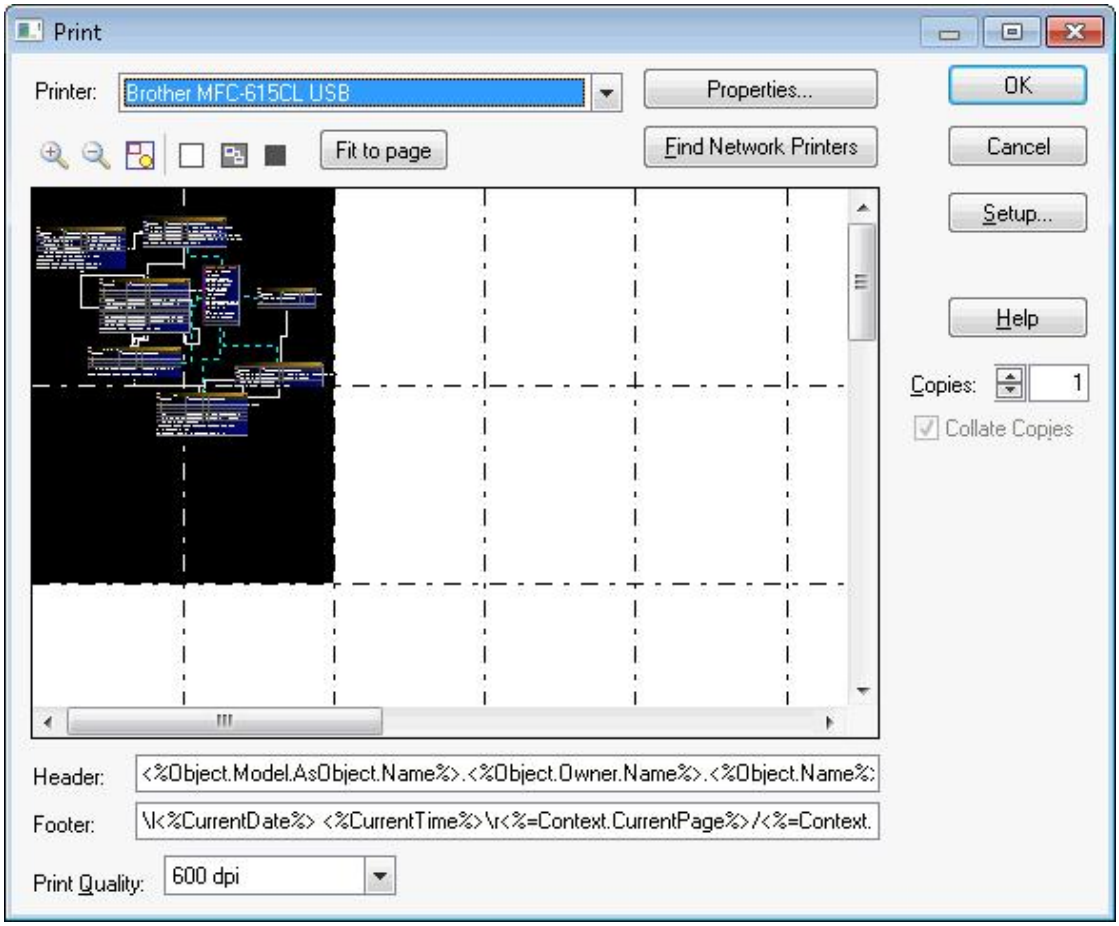
8.6 Print Dialog

The standard Print Dialog has been improved to let you change the page scale and to let you select the specific pages that you want to print:



You can drag the Print Page boundaries to scale the objects to the page bounds. You can toggle the printing of a specific page by clicking on the boxes defined by the page bounds.

Print Dialog Toolbar

- Zoom In on the Diagram's display
- Zoom out on the Diagram's display
- Zoom the display to fit the contents of the Diagram
- clear all page selections

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- select only pages that have something on them

- select all pages

Fit to page - scales the page boundaries to include all diagram objects. You can manually scale the page bounds simply by drag/dropping them.

Header/Footer: - enter the text or macros that you want to have printed in the header/footer margin. ModelRight will expand the macros when each page is printed. The macros are evaluated using ModelRight's sripting API.ModelRight prefixes the macros with the following script:

```
Sub Evaluate_OnLoad()
       Set Context = CreateObject("SCF.ScriptContext")
       Set Document = Context.ScriptDocument
       Set Options = Context.Options
       Set CurrentObject = Context.Object
```

User-define macros starting (text that starts with <% and ends with %>) are preprocessed by making the following replacements:

<% `Document.Write(Context.`
<%= `Document.Write(`
<%- `text evaluated "as-is"`

In addition to the usual Context values like CurrentTime and CurrentDate, CurrentPage and TotalPages are also available when printing. The Context.Object is set to the Diagram object.

Escape character \l, \c, and \r can be entered to indicate whether to print left, center, or right justified. The default is center.

8.7 Export JPG or Bitmap

ModelRight 4.0 provides the Export to JPG and Export to DIB/Bitmap features so that you can view your Diagram outside of ModelRight.

Note: The size of the Diagram that can be exported in this manner is inherently limited by memory constraints.

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Part

9 How to buy ModelRight

You can buy ModelRight directly online worldwide with all three major credit cards. As soon as your transaction is completed you will be able to download and install the program and start working right away.

Direct order link:

Online Store

ModelRight Software home page:

http://www.modelright.com

Email support:

support@modelright.com

Tech support phone :

(609) 423 9296

Fax: (866) 812-3742

Snail mail:

ModelRight, Inc.

66 Witherspoon Street
Suite 138
Princeton, NJ 08542
USA

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